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Honkanen, M.L.; von Moltke, K.; Hisschemoller, M.

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Report of the Concerted Action on the Effectiveness of International Environmental Agreements

Noordwijk Workshop, October 15-18, 1998

M.L. Honkanen, K. von Moltke, M. Hisschemöller and others

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vrije Universiteit *amsterdam*

IVM

Institute for Environmental Studies
Vrije Universiteit
De Boelelaan 1115
1081 HV Amsterdam
The Netherlands

Tel. ++31-20-4449 555
Fax. ++31-20-4449 553
E-mail: secr@ivm.vu.nl

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1. Introduction

1.1 Outline of the Concerted Action

The Concerted Action creates a network of researchers addressing the issue of effectiveness of international environmental agreements. It creates a forum for the development of a broadly based consensus on the most important factors that influence effectiveness as well as the most successful research strategies for identifying and analysing these factors. The ultimate aim is to generate ideas and suggest directions for future research, as well as to stimulate larger collaborative projects or research programmes. In addition to improving research on the effectiveness of international environmental agreements, the Concerted Action aims to provide important insights to those responsible for the design and administration of international environmental agreements.

The work is based on a classification of international environmental agreements, an inclusive definition of 'effectiveness,' and a preliminary list of factors to be considered. Multilateral environmental agreements are classified in three categories: (1) global environmental agreements (2) regional environmental agreements (involving significantly fewer than all countries), and (3) the environmental legislation of the European Community (i.e. involving a specific institutional structure to generate and implement the agreements).

The Concerted Action organises six workshops staggered over a period of 24 months, two for each category of agreement. These workshops are designed to present the current state of research from each respective category and to develop broadly based documents outlining strong hypotheses arising from this research. The second set of workshops in each category is designed to build upon and develop the results of the first workshop.

1.2 The Agenda-Setting Workshop

The Noordwijk workshop marked the first meeting of European scholars studying the effectiveness of regional and global environmental agreements. European scholars focusing more exclusively on the European Union level agreements met in a separate workshop on 25-27 September 1998 in London. The purpose of the Noordwijk workshop was to compare scientific approaches and methods, empirical data, main findings, and research priorities in this field of research. It was anticipated, furthermore, that a comparison of research findings and methodologies would be useful in order to establish a methodology and research framework facilitating and improving comparison of the various streams of research presently being carried out in Europe on the issue of effectiveness of international environmental agreements. Two papers by Oran Young and Arild Underdal, with contributions from Matthijs Hisschemöller, and Konrad von Moltke, provided the background to the Noordwijk workshop. After an initial session devoted to these papers, the workshop broke into four working groups to consider major issues for the Concerted Action. Reports from the working groups are included in this report. The workshop agenda and list of participants can be found in Annex. The second round of workshops, which will be convened in 1999, will focus in detail on particularly promising and

challenging research issues and research questions, empirical data and methodologies for future research in the field.

1.3 Project Methodology

Oran Young's paper, "The Effectiveness of International Environmental Regimes" and Arild Underdal et al.'s paper "The Study of Regime Effectiveness" (Appendices I and II) provided the methodological background for the workshop. Significant congruence was found between the papers. Both papers isolated the dependent and independent variables of the problem of regime effectiveness, and discussed in detail methodological issues relating to the analysis of these variables.

1.3.1 The Dependent Variable: Regime Effectiveness

Underdal et al.'s paper begins its analysis of the dependent variable, *regime effectiveness*, from the perspective that current understandings of regime effectiveness, premised on the idea of the regime's performance of a specific function or set of functions, or its general ability to 'solve' the problem(s) that motivated its establishment, is not sufficiently precise to be used in empirical research. Young agrees with the limited utility of this approach, noting an often unjustified correlation between regime implementation and problem resolution (or failure thereof) can lead to imperfect analysis. The challenge, in Young's view, is to isolate the degree to which the regime's operation can account specifically for improvement of the problem. The papers isolate several basic questions that must be grappled with in order to develop an effective conceptual framework for understanding regime effectiveness.

First, what precisely constitutes the *object* to be evaluated? In this sense, it is important to distinguish between the impact of the international environmental agreement itself and the costs incurred and positive and negative side-effects generated through the efforts to establish or maintain it. As well, Young and Underdal et al. note that a distinction should be made between the formal *output* flowing from the agreement's establishment (i.e. the norms, principles and rules constituting the agreement itself) and the set of consequences flowing from the implementation and adaptation to the international environmental agreement. In the context of environmental policy, the latter concept may be further refined. A distinction can be drawn between *outcomes* – consequences in the form of changes to human behaviour, including positive effects, deterrence and compellance, and *impacts* – consequences that materialise as changes to the state of the biophysical environment itself. Young notes increased preference for the analysis of outcomes rather than outputs or impacts, since a behavioural emphasis, though characterised by methodological problems related to causality, avoids even greater difficulties inherent to measuring impacts.

Second, against which *standard of success* is regime effectiveness to be evaluated? In this respect, one of the most important considerations surrounds the point (or trajectory) of reference against which this standard is compared. In the current research, several different points of reference are being used. Young describes the *pure theory* of regimes, which compares regime function with an assumed ideal wherein the regime's institutional arrangements are fully operational, have universal participation, and are undistorted by external factors. The counterpart of pure theory, *contextualised theory*, is more

commonly used in the discipline. It analyses "variance in the outcomes flowing from social interactions that can be explained in terms of the operation of regimes." One common approach to this end is assessing the hypothetical state of affairs that would have come about had the international environmental agreement never existed. Another is evaluation of the international environmental agreement against an 'ideal' solution, in technical terms the 'collective optimum.' Evidently, measures of success will vary depending upon which of the reference points is used.

Third, what kinds of *measurement operations* are needed to be able to attribute a 'success rating' to a particular international environmental agreement? There are several distinct challenges related to shifting to an empirical level of analysis. Both points of reference commonly used in contextualised theory are problematic. The no-regime scenario is counterfactual and must be inferred as it cannot be observed. Determining the collective optimum may be even more difficult. In addition, both cases require that we distinguish the effects brought about by the international environmental agreement from those effects that are caused by other factors (such as changes in technology, economic incentives, or developments endogenous to nature itself). Young points out an additional methodological difficulty related to the life cycles of regimes, wherein effectiveness typically follows a pattern of ebb and flow. These patterns prevent the untimely assessment of many regimes, particularly in cases where the regimes are designed to adapt and change over time.

1.3.2 Independent Variables: Factors Influencing the Effectiveness of International Environmental Agreements

Young and Underdal et al. go on to assess the independent variables of the problem of regime effectiveness. To the question, "why are some international environmental agreements more 'effective' than others?" two possible lines of enquiry are given.

The first line of enquiry concerns the *characteristics of the problem*, and to this end Young outlines several common elements of analysis: collaboration vs. co-ordination problems; transparency; regional vs. global problems; small vs. large actor groups, indefinite vs. short-term Cupertino. Both Young and Underdal et al. examine various typologies that have been developed. Underdal et al. suggest that substantial work is needed to advance a general theory explaining precisely how various problem characteristics influence regime effectiveness. First, the various typologies need to be analysed for possible overlap and/or differentiation in substantive content. It is suggested that typologies such as those developed by the Tübingen[1] or Oslo/Seattle[2] teams could be used to assess the basic problem structure, while game theory models could be used in the analysis of specific strategic choice situations. Second, empirical research is encouraged to de-

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[1] Andreas Hasenclever, Peter Mayer and Volker Rittberger, "The Tübingen Project on 'Distributive Consequences and Regime Robustness': Research Design and Preliminary Results," presented at the workshop, Concerted Action on the Effectiveness of International Environmental Agreements, Noordwijk, October 16, 1998; Volker Rittberger and Michael Zürn, "Regime Theory: Findings from the Study of "East-West" Regimes," *Cooperation and Conflict* 26 (1991): 165–83.

[2] Edward L. Miles et al., *Explaining Regime Effectiveness: Confronting Theory with Evidence* (forthcoming).

termine specifically how problem characteristics influence regime effectiveness, particularly with reference to different stages of the regime. In particular, multivariate analysis, analysis of characteristic interplay, and 'large-N' studies are needed.

The second major line of enquiry related to the independent variable examines variance in the problem-solving capacity of different systems. Underdal et al. note that 'capacity' is a complex concept that can only be determined with reference to specific tasks, which moreover each demand a different set of capabilities and skills. Two major determinants of capacity were identified: endogenous factors (factors related to the regime's characteristics), and exogenous factors (factors related to the wider political, economic and societal context in which the regime is embedded). Both factors determining capacity should be analysed at different stages of the regime.

In the study of effectiveness, several research questions arise concerning *endogenous factors* that affect regime capacity. Factors of note related to regime attributes and design include: capacity for flexible response, well-constructed systems of implementation review (SIRs), problem-solving approach, funding requirements, and substantive rules and regulations. Underdal et al. note that research is needed to isolate sophisticated generalisations about the effectiveness of different types of rules and regulations as policy instruments. Young points out the need to establish clear linkages between regime attributes and design features, on the one hand, and effectiveness, on the other, particularly with respect to the causal sequence of outputs, outcomes and impacts.

Underdal et al. note the research challenge of ascertaining how a regime's institutional setting influences the content and form of the regime. This research question involves thinking about institutions as *arenas* and organisations as *actors.* As such, the challenge is to analyse how the rules and norms of various institutions (as arenas) influence regime formation, and how differences between organisations (as actors) influence regime formation and implementation. However, Young disagrees with this approach, arguing that institutional arrangements merely serve as channels for the behaviour of its membership and other relevant actors, and cannot be understood as actors in themselves.

Several *exogenous factors* of interest to the study of regime effectiveness were isolated in the two agenda-setting papers.

First, Underdal et al. note that a sophisticated analytical framework needs to be developed to determine how the *distribution of power* within the regime influences its effectiveness in terms of regime formation and implementation. This could be done, for example, by developing a model that links the distribution of power with the configuration of interests in the regime.

A second factor, *skill and energy* (entrepreneurial and intellectual leadership), is an important, though elusive area of study. Related to this factor is the role of knowledge and its accompanying network of researchers ('epistemic communities') in policy formation, implementation and regime effectiveness.

A third area of research related to exogenous factors is the *sense of community* or identity in the international sphere that can influence the capacity for collective action within the regime. Young notes the connection between a regime's institutional arrangements and the unique social practices that consequently develop around them, giving rise to a community of actors enmeshed within a complex set of relationships. This community of

actors legitimises and aids in the functioning of the regime by 'gluing' the different systems of governance together. Both Young and Underdal et al. note the methodological difficulties related to this area of study, and the importance of developing analytical tools and models to better understand the role of civil society in regime effectiveness.

Fourth, it is important to understand regimes in a *contextual perspective*; regime interplay is a key area of study to this end and several types of interplay are considered. Horizontal linkages refer to connections between international environmental regimes and other regimes in operation at the international level. Types of horizontal linkages include embedded regimes, nested regimes and clustered regimes. Vertical linkages refer to connections between international environmental regimes and other regimes or institutions in operation at lower levels of organisation, such as the domestic level. The relationship of environmental regimes with regimes governing other issue areas, such as economic activities, is also noted.

Related to the contextual placement of regimes is the broader setting in which the regime is found. To this end, extraordinary external events, such as economic recession, and political tensions or hostilities are important factors of consideration. Young points out the research deficit in this area, relating to the influence of domestic political and economic systems and domestic state-society relations on inter-state Cupertino and ultimately regime effectiveness. Young also notes the importance, specific to the study of international environmental regimes, of consonance between a regime's institutions and the ecosystem(s) in question, and analyses specific factors to this end, such as ecosystem resilience and homogeneity.

1.4 The Noordwijk Workshop

The Noordwijk workshop was opened by two introductions. Helmut Breitmeier commented on the papers by Young and by Underdal et al. Ellen Hey provided a legal perspective on the issues being addressed. These two presentations gave rise to a general discussion.

The participants were subsequently divided into three working groups on:

- Regime Effectiveness: Concept, Measurement, and Relationship to Other Concepts
- The Role of Endogenous Factors
- The Role of Exogenous Factors

2. Workshop Reports, Saturday 17 October

2.1 Working Group on 'Regime Effectiveness: Concept, Measurement and Relationship to Other Concepts'

2.1.1 Procedure

Taking the papers by Young and Underdal et al. as starting points, the group was assembled to discuss concepts related to the dependent variable, i.e. regime effectiveness. In doing so, the group was able to elaborate upon many of the methodological issues raised in two papers. Their discussion addressed the three major research questions posed in the papers: What is the object of evaluation? Against which standard of success should the object be measured? And what kinds of measurement operations are appropriate to this research question?

The group began by analysing broadly-based concepts, such as regime robustness, that are related to regime effectiveness. In a similar vein, the group also examined macro-level consequences flowing from the regime's implementation, including factor of the interplay and nesting of different regimes. Relating to the first research question posed by the agenda-setting papers, the group then discussed the causal sequence outlined in the paper: outputs to outcomes to impacts. The group then addressed issues relating to the standard of success against which the regime's effectiveness is measured. Finally, the group ventured into an examination of the independent variable in a discussion about the characteristics of the problem, and the various problem typologies in place for assessing regime effectiveness.

2.1.2 International Regime Effectiveness: Concepts and Relationship to Other Macro Level Properties

The group noted that most assessments of regime consequences are framed in terms of problem-solving. From this perspective three concepts seem to merit particular attention: *effectiveness*, *robustness*, and *justice*. In addition, the group paid some attention to macro-level consequences, notably consequences of (sets) of environmental regimes for the international political system at large (including dimensions such as peace, order and stability).

During the discussion, particular emphasis was placed on the concept of *robustness* (resilience) of regimes, defined as the ability of regimes to survive under conditions of stress, defined as situations in which at least some actors have incentives to deflect. Cases where regimes are not put under stress serve as the baseline for comparison. Determinants of robustness remain an open and important question for further empirical research. It is hypothesised that regimes which are effective (in terms of problem-solving) are likely to be robust as well. Furthermore, (perceived) justice is likely to enhance both effectiveness and robustness.

In addition, the group discussed the challenge of analysing regime interplay. The effectiveness of an environmental regime may be significantly influenced by regimes established to manage economic activities (such as trade and investment). Conversely, environmental regimes may affect other regimes (i.e. international trade). Aggregation in a hierarchical sense (nesting) may lead the environmental regime to have effects more generally in world politics (i.e., create rules which become more universally applied after being 'invented' in the environmental domain, such as prior informed consent, or effects in the area of environment and security). As well, top-down effects from the broader realm of world politics to the international environmental domain are possible. Moreover, problem-solving in the environmental domain may create unintended malign consequences elsewhere.

2.1.3 From Outputs to Outcomes to Impacts

For any causal reasoning along the theoretical sequence of outputs - outcome - impacts (see papers by Young and Underdal et al., Appendices I and II), the advice of J. S. Mills may be useful: (1) factors must be strongly correlated, (2) the cause must precede the effect in time, and (3) no factor not included in the model explains the outcome. Single case studies have been particularly useful in early research on regime effectiveness. In order to enhance the generalisability of the findings and limit the threats to validity posed by multiple independent variables under scrutiny, it is advisable to embark on structured comparative case studies and/or large-N studies which allow for substantial variation of the dependent and independent variable scores.

Since causality cannot be unambiguously inferred in the case of quasi-experimental research, theory development explicating the mechanisms at work, and specification of the expected outcomes are of particular importance. Ideally, rival theories suggest different outcomes and allow researchers to examine their relative explanatory power.

2.1.4 Standards in Assessing Regime Effectiveness

The members of the working group emphasised problem-solving as the central aspect of regime effectiveness. Quite often, it is presumed that researchers actually know what problem-solving constitutes. Assessing the effect of international regimes includes at least two of the following steps: determining (1) the no-regime counterfactual (eg., performance in the absence of a regime), (2) the collective optimum (which may be derived as an optimal environmental, ethical, political or economic optimum), and (3) the actual performance relative to (1) and/or (2). A first requirement is to make clear which of the two standards ((1) or (2) above) is used in the assessment.

Most assessments of regime effectiveness seem to be framed in terms of standard (1). The no-regime counterfactual may, for example, be derived from projections at a specified point in time (i.e., a business-as-usual scenario), however, an ex post perspective in the tradition of the evaluation literature would allow for a plausible reconstruction of what would most likely have happened in the absence of a regime. In general, it seems more difficult to derive collective optima, although in fortunate cases expert advice can provide some guidance. It is important only to compare optima of the same class across various regimes, i.e. not to confuse ecological and economic criteria of what constitutes a good solution.

Any assessment of effectiveness implies a causal inference, i.e. attributing a certain effect to the existence and operation of a regime. One of the intriguing challenges in regime analysis is to separate the impact of a regime from effects brought about by other factors. The group suggested that one of the potential contributions of this Concerted Action program could be to put together a brief 'manual of best practices' for assessing regime effectiveness.

2.1.5 The Effect of Problem Structure and Situation Structure

The study of international regimes has produced substantial evidence in support of the general proposition that the prospect for effective Cupertino depends heavily on characteristics of the problem addressed. The group noted that somewhat different typologies have been used. For example, the Tübingen team has focused partly on a taxonomy referring to 'objects of contention' and partly on situation structures described in game theory terms. For its part, the Oslo/Seattle team has developed a scale of 'political malignancy' based on the presence of externalities, competition and asymmetries. The group agreed that it would be worthwhile to make an effort to examine in depth the relationship between or among such typologies. Some members suggested that 'problem structure' and 'situation structure' typologies could be seen as largely complementary in the sense that the former seemed useful primarily for categorising the basic problem while the latter could be used to analyse more specific strategic choices arising at different points in the life-cycle of a regime.

2.1.6 General Comments

Questions regarding differences in effectiveness among private international regimes (i.e., regimes where private actors play a dominant role) vis-à-vis government-dominated regimes were relegated to the working group on Endogenous Factors. In addition, the latter working group was encouraged to look at the internalisation of regime norms and rules.

2.2 Working Group on 'The Role of Endogenous Factors'

2.2.1 Procedure

As a starting point, the group noted that the agenda setting papers by Young and Underdal et al. included useful sections on the role of endogenous (institutional) factors. However, given the nature of the papers, these sections were quite general. Hence, in terms of procedure, quite naturally, the group developed a three stage approach. First, a rough 'institutional universe' was assembled. The group then quickly went through this list and rather impressionistically ranked the different factors first, in terms of the degree to which they are interesting for further research in the field and second, in terms of their potential importance for regime effectiveness. These two aspects are of course closely related, but they are not identical. For instance, given that decision-making rules in practice vary little across many international contexts, it could be argued that they are comparatively uninteresting as subjects for further research. However, the importance of decision-making rules for international outcomes and ultimately effectiveness can hardly be dismissed. Noting this caveat, the group used an A, B or C system to rank the factors. Not surprisingly, there were not many Cs. As the final and

most substantive step, the group spent some time discussing almost all of the identified factors in more detail. However, given the very limited time available and the sheer complexity of the 'endogenous agenda,' from this round of discussion only some brief observations and reflections related to these factors can be reported.

2.2.2 General and Overriding Factors

Although Underdal et al's distinction between the 'procedural,' or basic and more 'substantive' and 'programmatic' aspects of regimes is generally analytically helpful, the group experienced considerable difficulties in applying it during the quick run-through of their list of factors. Nonetheless, they did find it useful to distinguish between 'general/overriding' regime features, i.e. more analytical constructs such as 'flexibility', and more 'specific' and directly observable regime features such as decision-making procedures. It is also possible to see the general/overriding factors as *functions* which regimes must carry out in order to be effective. A list of six general and overriding regime features was assembled: 1) capability to deal with complexity; 2) robustness; 3) flexibility/dynamism; 4) equity/fairness; 5) problem-solving capacity; and 6) transparency. In terms of these features, the group generally concluded that the best way to get an analytical handle on these aspects is to work through the specific factors and, particularly, to assess their interplay.

2.2.3 Specific Factors

The group identified a set of sixteen specific factors; they are presented and discussed in the order that they were identified (in other words, quite haphazardly). Let us then briefly go through some main observations related to these factors. All factors are 'A rated', unless specifically indicated otherwise.

Systems for implementation review. Although important contributions have been made in this field, as noted in the agenda-setting papers, this was clearly seen as an important, multi-faceted issue for further research. SIRs can generally be described as institutions through which Parties share information, compare activities, review performance, handle non-compliance, and adjust commitments.[3] Specifically, the group discussed three main clusters of issues related to SIRs. First, such systems can obviously make important contributions to the general transparency and access to information within regimes. Second, the effective operation of such systems is probably dependent upon a well-tuned balance and interaction with other regime bodies, such as its funding mechanisms. Third, the effective operation of such systems is also dependent upon the design of the regime's regulations. Some regulations are simply more 'verifiable' than others are. The group noted that although all three clusters are interesting for further research, the second cluster, i.e. the balance and interaction with other regime bodies, in particular is important for further clarification.

Non-compliance and dispute settlement procedures. Such procedures spell out the agreed regime-specific procedures for handling situations of non-compliance from one or more Parties. This factor relates to the involvement and role of regime bodies such as Implementation Committees and the Conferences of the Parties, and the possible use of positive or negative incentives to strengthen future compliance. In terms of interest for further research, this issue was given a somewhat more moderate B/A ranking, primarily indicating that the issue needs

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[3] D.G. Victor, K. Raustiala, and E.B. Skolnikoff (eds), *The Implementation and Effectiveness of International Environmental Commitments*, Cambridge MA, MIT Press, p. 3.

to be linked to the broader issue of SIRs. Viewed in isolation, the procedures seem to have little clout. Interesting developments for further scrutiny were noted within the World Bank and the Commission for Environmental Cupertino (CEC; related to NAFTA).

Decision-making rules. A central distinction in this context can be made between rules calling for consensus among Parties and rules allowing for some sort of majority decision. It was noted that there is a need to substantiate the notion that consensus is bad for decisions, but good for implementation – and vice versa with respect to majority rules. To this end, interesting case studies include CEC, Convention on International Trade in Endangered Species (CITES), and the International Whaling Commission (IWC). Moreover, two issues for further study were suggested. First, the relationship between formal rules and practical effects – and possible 'hidden stick' effects in this connection – was brought up. Second, the institutional fit/match between decision-making rules at different levels was mentioned.

Access procedures and issues. This broad issue includes dimensions such as the right of other governmental and non-governmental organisations to participate in meetings within regime bodies, and the access of such groups and the public-at-large to information submitted by the Parties. The issue is clearly linked to the even broader and general issue of regime transparency. A need was noted to distinguish between access at the various phases of a regime's development, for instance between the decision-making phase and the implementation phase. Moreover, the issue needs to be linked to the study of exogenous factors and the role of civil society.

Funding mechanisms. This issue is also linked with several other factors, including access and participation issues, and the broader issues of SIRs and enhancing compliance. For instance, in the context of the ozone regime, the establishment of the Multilateral Fund in 1990 undoubtedly increased the interest of developing countries in further participation within the regime. Indeed, such funds may turn out to be a key factor in strengthening compliance among developing countries (although progress so far has been sketchy). Oil compensation funds were noted as a different type of funding mechanism, in this case related to questions of liability. Moreover, it was noted that there are interesting lessons to be learnt from the Structural Funds in the context of the European Community, particularly related to technology. Funding issues also, of course, touch upon more general concerns of fairness and equity.

Legal nature (of commitments). The main distinction here is legally binding 'hard law' commitments versus politically and morally binding 'soft law' commitments. Here, the interplay between the two forms of commitment was seen as especially interesting for further research.

Specificity of commitments. Apart from having interesting links to the legal nature of commitments, it was noted that the specificity of commitments has important implications for the operation of SIRs and the general issue of regime transparency.

'Tailoring' of commitments. This refers to designing commitments so as to maximise long-term benefits and positive indirect effects. For example, commitments might need to be sector-specific so as to provide an incentive for technological innovation, ultimately benefiting the problem-solution in the long run in some contexts (i.e. climate change). In other contexts, such innovation will be supported by applying a similar commitment across different sectors (i.e. ozone depleting substances). An area worth further research is how to optimise the tailoring of commitments under varying circumstances.

(Economic) instruments. Examples of economic instruments include Joint Implementation, systems for emissions trading, and eco-labelling. It was noted, however, that a good catalogue of potential economic instruments is far from complete. Generally, such instruments can be seen as efforts to better cope with environmental and economic circumstances that vary widely on a global scale. There is a very important interplay between economic and other instruments.

The organisation of scientific/technological advisory work. Interesting issues here included how to design regimes that are able to cope with normal controversies within the scientific community and to deal with fact that panels are not balanced.

Membership/scale. Within the Concerted Action context, dividing international environmental agreements into global and regional 'nodes', this dimension is of course especially interesting. Are there marked differences in design and implications for effectiveness related to the scale of the regime – global or regional? It can be assumed that regional solutions, first, imply a greater homogeneity of the Parties involved and, second, generally stand a better chance of handling difficult trade-off challenges. Moreover, in terms of global problems, it is interesting to consider under what conditions regional sub-solutions are possible and effective.

Role of secretariats. Interesting dimensions here are related to the autonomy of such secretariats and their guardian functions related to agreements. Are they formally identified as such guardians? There is an important interplay between the role of secretariats and the complexity of the underlying problem structure. If the problem is highly complex, the role of the secretariat gains particular importance. As well, an important interplay with national foreign ministries was noted.

The group also briefly discussed aspects including interplay and linkages to other institutions, capacity to deal with conflicting priorities, and scope/agenda.

2.2.4 General Comments

Overall, the group found it interesting and rewarding to carry out an initial brainstorming session with an open agenda. However, it was felt that future gatherings should find a way to delimit and focus the agenda considerably.

2.3 Working Group on 'The Role of Exogenous Factors'

2.3.1 Procedure

Drawing upon the papers by Arild Underdal et al. and Oran Young, the group focused on exogenous factors influencing the effectiveness of international environmental agreements. In an initial brainstorming, participants randomly listed exogenous factors which were of importance in their current work. Second, the participants clarified the variables and clustered them into categories. It should be noted that the categories are not exclusive, but simply a convenient way to structure the discussion. Third, the group tried to conceptualise the factors and to formulate hypotheses relating to their impact upon agreement effectiveness. The factors were also examined with respect to whether their role varies across global and regional IEAs.

2.3.2 Discussion of Specific Factors

Non-state actors/societal practices

Role of industry. The group noted that this area requires further research, since until now the role of industry has been studied primarily at the national level. The question of the conceptualisation of industry was raised. Essentially, the problem-specific structure of industry needs to be taken into account. Can status quo, mixed-interest and environmental actors be distinguished? Does the homogeneity/heterogeneity of industry explain effectiveness? How does industry affect the power structure within the regime? Can it exert a co-opting influence? How does it influence the information input to the regime?

The role of industry may vary depending on the stage of an IEA (formative, negotiation, implementation). Moreover, industry can have an indirect influence beyond its capacity for direct lobbying. It has an ecological modernisation capacity and acts as a knowledge-producer. As well, it may form coalitions with NGOs. Other questions were raised. What influence does regulatory capture have? Does the degree of regulatory capture influence the effectiveness (not necessarily fairness) of the IEA?

Civil society. The group was not entirely satisfied with Oran Young's definition of civil society describing the organisational networks of non-state actors. First, he seems to set civil society merely in a national context. However, with respect to IEAs, the emergence of transnational networks is also of interest. Indeed, the notion of a 'nascent fragmented international civil society' merits further consideration and research. Second, the notion of civil society implies a certain degree of self-organisation and autonomy of social actors from the nation state. Access to information and other civil rights form an important aspect of civil society. Third, shared values, identities etc. also form an integral part of civil society; therefore, a (changing) normative dimension needs to be taken into account in addition to the organisational features of civil society.

The study of the role and the possibility of building civil society building merits further research. It is however not entirely clear whether and why civil society/democratic governments contribute positively to the effectiveness of regimes. Civil society may result in a better allocation of scarce resources, or it may strengthen the distribution of resources and increase equity. Civil society may improve the order of law, or add to accountability and increase the legitimacy of the regime. Alternatively, it may improve the flow of information in the regime.

Modernisation and the emergence of civil society may in fact facilitate the emergence of IEA, which can contribute to or reflect changes in values within civil society. There may be, however, a mismatch between the values of civil society and the values reflected in the IEA. At the same time, it may cut in both ways. It may be that authoritarianism is the more appropriate and/or effective way to deal with some environmental problems.

An interesting question in this context is the *role of parliaments* (as representative of civil society) and the absence thereof in IEAs. Through IEAs, national parliaments may be disfranchised; as a result we see attempts to bring parliaments back into the process, through GLOBE and other networks of MPs. Does the involvement of national parliaments contribute to the effectiveness of IEAs?

World culture. In the context of preservation of the environment, does a world culture, with shared values and perceptions, exist? How do these values emerge, exist and diffuse? How do world-wide attitudes, lifestyles and concerns for the global environment influence IEAs

and contribute to their effectiveness? It may be that current global trends in favour of liberalisation, 'CNN-isation,' and 'CocaCola-isation' serve to undermine effectiveness of IEAs. Deeper research into the question of world culture will require broadening the field of research to take into consideration schools such as constructivism and other disciplines such as sociology.

Media (including the Internet)

Structure/distribution/equity

Progressive development of international law. The power of precedent and the notion of 'best legal practice' have an impact on the design and/or the evolution of environmental institutions. As progressive principles of international law are developed, they are incorporated into IEAs, both in terms of their procedural aspects and substantive rights and norms. Examples of such principles include the principle of differentiated obligations, and the 'polluter pays' principle. For example, it can be hypothesised that the degree of embodiment and application in international law of the Rio principles has had a positive effect on the effectiveness of IEAs. Generally, it was noted that the development and the use of principles of international law has a positive effect on regime effectiveness and equity, which sometimes includes compensation for structural imbalances and has the ability to shape or change power relationships. Alternatively, international law principles may also follow a regressive pattern, depending upon which principles (economic, social etc.) have precedence/priority. It was noted that progressive development might also be an endogenous factor.

(Im)balance/distribution of knowledge. There is a cleavage in knowledge between North and South, and between West and East. Knowledge shapes and pushes interests, and hence the OECD countries exert a dominating influence over IEA agenda setting. To this end, the relationship between knowledge distribution and the effectiveness of IEA needs to be explored. How does the (im)balance of knowledge/uneven access to knowledge influence the effectiveness of IEAs ?

Uncertainty. (Scientific, economic and political) uncertainty is a constant feature of IEAs, forming a key characteristic of the problem type. As uncertainty increases, the complexity of the problem also increases. It is important to examine several factors related to uncertainty. What is the knowledge base? How is the problem assessed? How does uncertainty influence the behaviour of political and economic actors? What is the risk behaviour? What are the fairness/equity assumptions under uncertainty? How does uncertainty influence the regime design? Is the Risikogesellschaft compensated through communication? What are the uncertainty assessments/choices? Are panels, integrated assessment, consensus conferences etc. an effective way to deal with uncertainty? It was noted that uncertainty coupled with a weak knowledge base may diminish the effectiveness of an IEA.

Historic relations/degree of interdependence. Are there patterns of relationships among the Parties to an IEA? It seems that no permanent coalitions can be observed. Are there issue/problem specific coalitions? Do historic relations or the degree of interdependence influence actors/coalition behaviour?

Differentiation. Regional variations in the effectiveness of IEAs can be observed. Thus external factors influencing differentiation have to be investigated. States, for instance, differ in certain features such as institutional culture, capacity, communication, adaptation and innovation. What are the criteria for differentiated obligations?

Leadership

Symbolic politics. Symbolic politics often form a part of IEA negotiations. What are these 'symbols'? To what extent do they influence effectiveness?

Leadership type/regime stage. There are different types of leadership, i.e. structural, intellectual, entrepreneurial, individual. How do different types of leadership influence the effectiveness of IEAs?

Leadership without power/leverage of small or weak actors. The phenomenon of leadership without power can be observed in IEAs, namely small countries exerting influence through charismatic leadership or the power of ideas.

Interplay/linkages

It was noted that interplay among different regimes in general should be a focus of analysis.

Governance without government. IEAs form only one part among multiple sets of regimes within multiple arenas. There is a substantial amount of governance without government in the international system. The coexistence of different, conflicting regimes merits more study. Several research questions were posed. First, however, the definition of a 'regime' is unclear – what is a regime and how many are there? Are markets, for instance, regimes? Second, what is the interplay, the linkages and the hierarchy among different regimes? What is the relationship between economic and ecological regimes? Are there other important regimes influencing IEAs, i.e. security, human rights etc.? How are different regimes accommodated? Are there principles regulating interplay? Are institutional boundaries among/between environmental and non-environmental regimes blurred? It was noted that a study undertaken by Carnegy examines cross-sectoral interplay.

Economic - environmental regimes. Is there a hierarchy of regimes and how does it affect IEAs? Is trade a 'pre-emptive norm'?

Power of precedent/lessons learned. Is there interbreeding/cross-fertilisation/regime contagion? Do new opportunities arise from new regimes? How do the lessons of other regimes influence the formulation or operation of IEAs? Is there a levelling-up? The power of precedent may drive or inhibit innovation.

Environment - economy - security. Depending on abatement costs or vulnerability, an IEA may become part of national security considerations, since they touch upon issues of sovereignty, domaine reservée, vital interests etc. Especially in developing countries, environmental issues are considered to be of national security interest.

Privatisation of sovereign obligation. Increasingly, a privatisation of sovereign obligations can be observed. Several questions were formulated. How does the involvement of non-state actors influence the form and function of governance? What is the interplay between markets and regimes? What is the (legal) nature of contract under privatisation? Who carries responsibility and/or liability? Is it possible to have 'private' international regimes? Privatisation leads to linkages between different legal systems (private/public). This research question touches upon both endogenous and exogenous factors. For example, increasingly successful domestic models are transferred to IEAs, as in, for instance, the US, which has exported its culture to the IEA.

Institutional band-wagon effect/'pigs around the trough'. Regimes external to IEAs offer their services, and in this sense IEAs are instrumentalised by other regimes. For example, the

GEF, UNEP, UNDP etc., searching for a role within the process, offering their services to the FCCC.

Subsidiarity/nested regimes/intermediate decks. How should responsibilities be divided across different levels? How are the activities at the different levels co-ordinated? How do global and regional regimes influence each other ?

Fit/spill-over

General Comments

These factors are relevant at both the global and the regional level of analysis. The only major variation relates to culture and civil society. At the regional level, the fragmentation of culture is less acute, and the imbalance of knowledge may be less pronounced.

Table 2.1 Endogenous and Exogenous Factors Identified by the Working Groups

Endogenous Factors	Exogenous Factors
General/Overriding Features • Capability to deal with complexity • robustness • flexibility/dynamism • equity/fairness • problem-solving capacity • transparency	Role of non-state actors/societal practices • role of industry • civil society • world culture • media Structure/Distribution/Equity • progressive developments in international law • (im)balance/distribution of knowledge • uncertainty • historic relations/degree of interdependence • differentiation
Specific Regime Features • systems for implementation review (SIRs) • non-compliance and dispute settlement procedures • decision-making rules • access procedures and issues • funding mechanisms • legal nature (of commitments) • specificity of commitments • 'tailoring' of commitments • instruments (i.e. Joint Implementation) • the organisation of scientific/technical advisory work • membership/scale • interplay and linkages to other institutions • capacity to deal with conflicting priorities • role of secretariats • scope/agenda • budgetary matters	Leadership • symbolic politics • leadership type/regime stage • leadership without power/leverage of small or weak actors Interplay/Linkages • governance without government • economic – environmental regimes • power of precedent/lessons learned • environment/economy/security • privatisation of sovereign obligation • institutional band-wagonning/ 'pigs at the trough' • subsidiarity/nested regimes/intermediate decks • fit/spill-over

3. Conclusions

The Noordwijk Workshop outlined an exceptionally ambitious research agenda which has thus far been covered to a modest degree only. Answers to most of the aspects identified in the Working Groups are not currently possible; more robust hypotheses have been developed in some areas than in others. It is also unlikely that the research program implied by the Noordwijk Workshop will be accomplished within the time frame of the Concerted Action.

Nevertheless the ability to articulate a comprehensive and systematic research agenda in relation to the effectiveness of international environmental regimes represents a step forward, establishing as it does the need for research and creating a benchmark against which future research can be measured. The issues raised in the Working Groups represent ample opportunities for research at all levels -- that is for student projects, dissertations and major research projects -- including joint efforts involving teams from different disciplines and different countries. It is to be hoped that the participants in the Noordwijk Workshop will advance elements of this agenda over the next few years. At the next meeting, scheduled for the fall of 1999, the Concerted Action will turn to the identification of priority topics.

Appendix I

The Effectiveness of International Environmental Regimes:

A Mid-term Report

Oran R. Young

A striking feature of the recent past is the sharp rise both in public concern about large-scale environmental problems and in the creation of international regimes as a means of addressing these problems.[1] Many see in this development a hopeful sign regarding the prospects for solving numerous problems ranging from unsustainable uses of shared natural resources (e.g., boundary waters or straddling stocks of fish) through long-range transboundary pollution problems (e.g., acid rain) to the challenges associated with global environmental changes (e.g., the loss of biological diversity or the alteration of the Earth's climate system). How realistic is this hope? To ask this question is to launch an inquiry into the effectiveness of the institutional arrangements or regimes that have been established in recent decades to deal with a wide range of environmental problems arising at the international level.

The purpose of this essay is to provide a mid-term report on this enterprise. In the process, I seek to assess what we currently know about the effectiveness of international environmental regimes; determine what more we need to know about these arrangements to improve their performance in the future; and evaluate the relative merits of several research strategies available to those desiring to obtain this knowledge. The picture that emerges from this survey is a mixed one. We already know a number of things about the determinants of regime effectiveness. Yet adding substantially to our current understanding of these matters presents major analytic challenges that will constitute cutting-edge concerns for regime theory throughout the foreseeable future.

1. Defining Effectiveness

At first glance, the meaning of effectiveness with regard to international environmental regimes seems intuitively obvious.[2] Regimes arise to solve problems. Accordingly, effectiveness is a measure of the extent to which these arrangements succeed in solving the problems that led to their formation. Appealing as this approach to effectiveness is, however, it has severe limitations as a basis for analyzing the performance of international regimes. As numerous observers have pointed out, participants can and often do develop widely divergent perceptions of the nature or character of the problem to be solved, and regimes frequently come into existence in the absence of consensus in the realm of problem definition. The danger of ending up with spurious correlations is a constant threat to efforts to understand regime effectiveness construed as problem solving. The disappearance or amelioration of a problem following the formation of a regime does not constitute proof that the regime was a causal agent in the process. Conversely, the failure of a problem to disappear following regime creation does not justify the conclusion that the regime had no effect at all; the problem could well have grown more severe in the absence of the regime. More generally, the operation of a regime is typically only one of a

suite of factors—both intended and unintended—that play some role in determining the course of international environmental problems. More often than not, the real problem is not in determining whether a regime matters at all but rather in finding ways to determine the proportion of the variance in the realm of problem solving that can be attributed persuasively to the operation of the regime. Yet given the limited size of the universe of cases and the amount of variance within this universe, finding ways to demonstrate the causal significance of international regimes as problem solvers is a tall order.

Faced with this somewhat daunting prospect, many analysts have sought alternative ways to think about the effectiveness of international regimes. Students of both law and politics commonly direct attention to issues of implementation and compliance rather than problem solving.[3] Do regime members take vigorous steps to implement regime rules or commitments within their domestic jurisdictions? Do states or subjects operating under their auspices comply with regime rules or live up to the commitments they make in creating regimes? This alternative has the virtue of being easier to operationalize; it is relatively easy to follow efforts to implement regulatory provisions or to get programmatic activities underway. But it leaves much to be desired as a way to think about effectiveness. Above all, there is no direct relationship between implementation and compliance, on the one hand, and the solution of pressing problems, on the other. Regimes can score high in terms of implementation or compliance without solving the problems that led to their creation in the first place. Conversely, regimes can have far-reaching consequences, even when their performance seems mediocre with respect to conventional measures of implementation and compliance. Some regimes are able to tolerate fairly extensive violations without becoming ineffectual. As well, regimes may lead to substantial alterations in the behavior of key actors that have little or nothing to do with conforming to specific rules or commitments. Under the circumstances, a turn toward implementation and compliance as a way of conceptualizing effectiveness is apt to be accompanied by a loss of analytic rigor and a constant battle with empirical messiness.

Given these difficulties, a growing community of analysts have directed their attention toward behavioral consequences as a measure of the effectiveness of regimes. International regimes are not actors in their own right, though they may give rise to organizations whose function is to administer their provisions.[4] The question to be answered is whether regimes or governance systems play a role in shaping or guiding the behavior of those who are actors, including both the states that are ordinarily the formal members of international regimes, and the government agencies, corporations, interest groups, and even individuals whose behavior is targeted by a regime's provisions. We want to know, in other words, not only whether the United States fulfills its obligations under the terms of the regime dealing with ozone-depleting substances, but also whether producers and consumers of such substances operating under the jurisdiction of the United States alter their behavior in response to the creation and operation of the regime.[5] Of course, it is important to observe that the behavioral effects of regimes include *deterrence* in the sense that actors are induced to refrain from taking steps they would have taken in the absence of the regime, as well as *compellence* in the sense that the presence of the regime induces actors to take steps they would otherwise have failed to take.[6] As we shall see, moreover, both theoretical and methodological challenges are associated with efforts to demonstrate the causal connections between the operation of a regime and the behavior of affected actors. For instance, much depends on the extent to which actors are prop-

erly treated as unitary utility maximizers or as more complex entities that respond to a variety of non-utilitarian stimuli.[7] And regimes are almost always only one of a number of forces that operate—simultaneously or sequentially—to shape the behavior of relevant actors, a fact that makes it necessary to devise ways to sort out the relative impact of regimes from the impacts of other sources of behavior. Nonetheless, the focus on behavior lends empirical content to the study of regime effectiveness, and it has the added virtue of preserving a clear link to the underlying concern for problem solving.

In considerable measure, these approaches to effectiveness map onto the distinctions that students of public policy commonly draw among outputs, outcomes, and impacts.[8] *Outputs* are regulations, programs, and organizational arrangements that actors establish to operationalize the provisions of regimes or, in other words, to move them from paper to practice.[9] *Outcomes* encompass changes in the behavior of those subject to the provisions of regimes, whether these changes involve bringing actions into conformance with the requirements of regimes or making other adjustments that become attractive as a result of the establishment of regimes. For their part, *impacts* have to do with problem solving in that they involve effects measured in terms of the concerns that lead actors to create regimes in the first place. Impacts may range from marginal to decisive; there is no need to think of them in all-or-nothing terms. In some cases, regimes give rise to new problems, whatever their impacts in terms of the problems leading to their creation. Clearly, there is every reason to take a lively interest in all three of these types of regime consequences. Yet these comments help to account for the growing tendency among regime analysts to focus particular attention on outcomes in contrast to outputs and impacts. The study of behavior allows the observer to avoid the formalism that marks many analyses of outputs, while skirting some of the analytic problems associated with efforts to demonstrate the occurrence of impacts in a convincing manner.

Two additional conceptual issues are worthy of consideration in this discussion. An important difference exists between what we may call the pure theory of regimes and the contextualized theory of regimes or, for that matter, social institutions in general. The pure theory seeks to illuminate the logic of regimes on the assumptions that specific institutional arrangements are fully operational, accepted by all relevant subjects as facts of life to be complied with as a matter of course, and not subject to distortion resulting from the impact of outside forces. Analysis then focuses on the outcomes that can be expected to flow from the operation of these arrangements over time.[10] To take some concrete examples, this leads to assessments of the probable outcomes resulting from the operation of different electoral systems (e.g., proportional representation vs. single-member districts), different decision rules in legislative settings or committees, and different structures of property rights.[11] Contextualized theory, by contrast, focuses on the extent to which regimes actually affect the behavior of those subject to their provisions and on the relationship between the character of regimes as they are intended to operate in principle and the character of institutional arrangements as they operate in practice. The central concern here is to probe whether and to what extent regimes actually do determine the flow of collective outcomes in various social settings. Pure theory is largely an analytic exercise employing deductive reasoning and, in some cases simulations, to explore the dynamics of institutions as such; the results tend to be normative rather than descriptive. Contextualized theory is mainly an empirical exercise involving the use of a battery of

techniques designed to determine the proportion of the variance in the outcomes flowing from social interactions that can be explained in terms of the operation of regimes. While both types of analysis are worthwhile, most recent efforts to understand the effectiveness of international regimes take the form of contextualized theory.[12] The central questions are: Do regimes matter and what proportion of the variance in world affairs is attributable to the operation of these institutional arrangements?

In asking whether regimes matter, it is worth noting as well that these arrangements—both singly and in combination—can generate broader consequences by altering the knowledge base available to actors in international society, the relative status of international actors, or even the constitutive features of international society as a whole, quite apart from their success in solving specific problems.[13] Taken together, for example, the rise of international environmental regimes over the last several decades has surely played a part in enhancing the role of nongovernmental organizations in world affairs and in sensitizing us to the significance of global civil society as a factor in environmental problem solving.[14] The study of these broader consequences is obviously important. In the long run, their impact may even overshadow the performance of regimes in solving or alleviating a variety of specific environmental problems arising at the international level. But the study of broader consequences is an endeavor that is separate from the analysis of regime effectiveness as such. Conflating the analysis of regime effectiveness and the study of broader consequences is a recipe for confusion. The focus of this article is effectiveness, leaving the question of broader consequences to another occasion.

2. Variations in Regime Performance

How much do regimes vary in terms of effectiveness? How can we measure this variance under real-world conditions? Given the preceding account of the difficulties associated with the concept of effectiveness, it will come as no surprise that we have yet to devise a straightforward way to operationalize the concept, much less to construct a generic index for charting shifts in the effectiveness of individual regimes over time or to compare and contrast different regimes with respect to levels of effectiveness. This is a serious problem; it limits our ability to treat effectiveness as a dependent variable whose behavior can be followed in an unambiguous and uncontroversial manner. Ideally, an interval scale would allow us to track effectiveness in much the same way that we use temperature as a measure of the behavior of the human body or gross national product (GNP) as a measure of the performance of economic systems. At this stage, the development of such a scale is beyond our reach. A more realistic goal over the short run is the development of a ordinal scale that would make it possible to rank regimes from high to low in terms of effectiveness and to monitor the performance of individual regimes over time in these terms.[15] Even the development of such a scale allowing us to evaluate regime effectiveness with confidence seems daunting. Yet some such procedure is essential for those interested not only in measuring effectiveness but also in framing and testing hypotheses that can help to explain or predict variations in levels of effectiveness over time and across regimes.[16] Realistically, at this stage we should be aiming to devise a relatively simple ordinal scale that differentiates among four or five levels of effective-

ness and that well-informed analysts may use to code the effectiveness of regimes with reasonable confidence.[17]

Notwithstanding these problems of measurement, students of international regimes generally agree regarding the performance of specific arrangements, at least in general terms.[18] Among those regimes that are widely viewed as ranging from effective to very effective are the Antarctic Treaty System, the Great Lakes Water Quality regime, the arrangement covering the dumping or incineration of wastes in the North Sea, and the regime for the protection of the stratospheric ozone layer.[19] Conversely, the list of regimes that most analysts would rank as ineffective or very ineffective includes the agreement on the conservation of migratory species of wild animals, the international tropical timber regime, many of the Regional Seas arrangements operating under the auspices of UNEP, and most species-specific and area-specific arrangements dealing with marine fisheries.[20] Most would concur as well in reaching mixed conclusions regarding the effectiveness of a number of other regimes, such as arrangements dealing with long-range transboundary air pollution in Europe, international trade in endangered species of wild fauna and flora, pollutants discharged into the Rhine River, and transboundary shipments of hazardous wastes. Imprecise as they are, these widely shared rankings offer some grounds for optimism regarding efforts to assess the effectiveness of international regimes.

Most observers would also agree that there are a number of circumstances in which it is difficult to arrive at straightforward rankings regarding the effectiveness of regimes. It is common for specific arrangements to follow a kind of life cycle, typically becoming increasingly effective with the passage of time and, in some cases, outliving their usefulness in due course. The regime dealing with intentional oil pollution at sea, for example, clearly became more effective following a shift from discharge standards to equipment standards.[21] Many traditional conservation regimes, which focus on efforts to regulate consumptive uses of living resources, have lost effectiveness with the rise of concerns for habitat protection and ecosystems management.[22] Beyond this, there are cases in which serious ambiguities impede efforts to arrive at judgments about regime effectiveness. Most observers agree that the regime for whales and whaling was ineffective during its early years but became more effective during the 1970s. But the sharp differences of opinion about the effectiveness of this regime in more recent years are attributable not to disagreements about the behavioral impacts of the regime but rather to conflicting views regarding the purpose of the regime.[23] Of course, in some cases judgments about the effectiveness of regimes must remain tentative until these arrangements have been in place long enough to compile a track record sufficient to provide a basis for assessment. Obvious examples include the arrangements established during the 1990s to deal with problems such as climate change, the loss of biological diversity, and desertification. More generally, it is difficult to make early assessments about the effectiveness of regimes based on framework conventions that are intended to initiate a continuing process of regime formation.[24] All these issues complicate efforts to rate specific regimes in terms of effectiveness; they give rise to substantial differences of opinion in some cases. Unlike the conceptual difficulties discussed in the preceding section, however, these matters are largely empirical problems to be solved pragmatically rather than problems

that point to disagreements about what we mean in speaking of the effectiveness of regimes.

Clearly, we have a long way to go in the effort to construct an index of performance that will allow us to explore effectiveness systematically as a key variable in regime analysis. But even at this stage, we know enough to lay to rest the sterile debate about whether international regimes matter at all or are properly understood as epiphenomena that merely reflect deeper driving forces in international society.[25] The essential point to note is that substantial variance in effectiveness exists both among regimes and within regimes over time. This is not to say that there is consensus among observers about the ranking of particular regimes on the scale of effectiveness; far from it. But virtually everyone agrees that some regimes have been remarkably successful, while others have turned out to be dismal failures. Even more common are cases in which performance lies somewhere between these extremes. It follows that the appropriate course at this time is to turn our attention to a sustained examination of the sources or roots of institutional effectiveness. This exercise promises to be far more productive and interesting than a continuation of sectarian battles over whether regimes matter.

3. What Do We Know about the Sources of Effectiveness?

Research on the effectiveness of international environmental regimes is still at an early stage. As the preceding discussion makes clear, serious methodological problems stand in the way of progress in this area. Even so, we already know a number of things about the sources of institutional effectiveness in this domain, and we have some good leads concerning where to direct our attention in analyses of effectiveness during the next phase of research on environmental regimes. This section seeks both to pinpoint what we know already about the determinants of success, and to characterize what we need to know about effectiveness under five headings: problem structure, regime attributes, social practices, institutional interactions, and broader setting. The following section discusses plans of attack for broadening and deepening our current understanding of these matters.

Problem Structure

Some international problems are easier to solve than others. Thus, co-ordination problems are easier to deal with than collaboration problems, largely because participants have no incentive to violate the rules developed to solve co-ordination problems.[26] Devising a successful governance system for air transport is less challenging than devising an effective regime to regulate transboundary air pollution. Situations featuring high levels of transparency (in the sense that it is easy to tell whether those subject to regulatory rules are complying with their requirements) are easier to deal with than situations in which subjects—including private actors as well as public agencies—can violate the rules clandestinely.[27] Consider the difference between equipment standards and discharge standards with regard to intentional oil pollution at sea as a case in point. Other things being equal, problems involving large numbers of actors, either as parties to the agreements themselves or as subjects of the regulatory arrangements devised, are harder to deal with than small-number situations.[28] Think of the differences between the protection of the stratospheric ozone layer and the Earth's climate system in these terms. Simi-

lar remarks are in order about the length of the shadow of the future.[29] In cases where parties are engaged in interactions expected to last indefinitely (e.g., the governance system for Antarctica), incentives to cooperate will be stronger than in cases where the relationships are short-lived (e.g., short-term arrangements dealing with the exploitation of a finite resource).

What we lack at this stage is a comprehensive or generic index to rank and compare problems in terms of the difficulty of solving them. A number of analysts have made sustained efforts to develop an index of this sort. The most influential of these efforts involve the problem-structural approach of the Tübingen group, which looks at regime formation as a means of solving conflicts and rates problems in terms of what is called 'regime conduciveness,' and the work of the Oslo/Seattle group, which focuses on interests or preferences and looks to game-theoretical constructs as a way of differentiating among problems in terms of how hard it will be to solve them.[30] Each of these approaches has added to our understanding of problem structure. But as I have demonstrated elsewhere, both are fraught with analytical difficulties and problems of operationalization that limit their usefulness as procedures for rating real-world problems on a scale of hardness.[31]

Regime Attributes

Regime design matters.[32] Because regimes are not actors in their own right, it is inappropriate to think of these constructs as agents that succeed or fail in connection with assignments they receive from their creators.[33] Nevertheless, institutional arrangements do serve to channel the behavior of both their formal members and wider arrays of actors operating under the auspices of regime members. In the process, they affect the content of collective outcomes flowing from interactions among actors in international society. Here, too, we already have some knowledge of the roots of institutional effectiveness. A capacity to respond flexibly and to evolve over time is particularly important to the success of regimes that deal with environmental issues, where our understanding of the relevant biophysical systems is developing rapidly, in some cases as a consequence of the operation of the regimes themselves. Well-constructed systems of implementation review (SIRs) appear to be important as methods of retaining the attention of policymakers and avoiding the onset of the 'out of sight, out of mind' syndrome in almost every case.[34] There is much to be said for approaching issues of compliance with the rules and decisions of regimes as management problems rather than or in addition to enforcement problems.[35] The extent to which regimes require secure sources of funding to prove successful depends upon the nature of the tasks they are expected to perform. Programmatic tasks such as helping developing countries to avoid increases in the production and consumption of ozone-depleting substances, for instance, present greater funding requirements than procedural tasks such as making annual decisions regarding allowable harvest levels for living resources.

As in the case of problem structure, much remains to be learned about the role of regime attributes as determinants of effectiveness. While many see the widespread use of consensus rules at the international level as a source of weakness, for example, the links between decision rules and regime effectiveness are poorly understood.[36] Similar remarks

are in order regarding the role of what we now think of as noncompliance procedures (NCPs) in contrast to more formal dispute settlement procedures (DSPs), which are typically included in the constitutive provisions of international environmental regimes, but which seldom loom large in the actual operations of these regimes.[37] More generally, we need to improve our understanding of the relationships between regime attributes, on the one hand, and effectiveness construed in terms of outputs, outcomes, and impacts, on the other. Thus, regimes that look impressive at the level of outputs are not necessarily successful when it comes to solving the problems that led to their creation in the first place. Regimes that produce striking results at the level of outcomes can generate unintended side effects that offset or even swamp the progress they bring about in terms of curbing or redirecting the behavior giving rise to the problem to be solved. For example, it is difficult to provide a clear assessment of the effectiveness of a regime for the management of fish or marine mammals that succeeds only by shifting the attention of harvesters from one area or one species to another.[38]

Social Practices

Institutionalization enhances effectiveness. To be more specific, an important finding emerging from studies of effectiveness concerns the relationship between institutional arrangements in the narrow sense and the social practices that grow up around them. Regimes as such are sets of rules, decisionmaking procedures, and programs. But every successful regime gives rise to an encompassing social practice in which the members themselves become enmeshed in an increasingly complex web of interactive relationships and in which a variety of actors with no formal roles in the regime emerge as players. It is the growth of a vibrant social practice that typically legitimizes a regime in the thought processes of various actors, fleshes out the constitutive provisions of a regime with a range of important informal understandings, transforms the rules of a regime into standard operating procedures, and gives rise to an informal but attentive community of actors interested in the success of the regime and prepared to function as watchdogs keeping track of its performance.[39] Our present understanding of the connections between regimes in the narrow sense and social practices is quite limited. But it is already clear that the way forward will involve a sustained effort to integrate insights drawn from the institutionalism of economics, which typically focuses on regimes in the narrow sense, and the institutionalism of sociology, which tends to direct attention to the character of social practices.[40]

Recently, we have become aware that civil society exists at the international level just as it does at the domestic level.[41] Construed as a network of social connections that exists above the level of the individual (or the individual state in international society) and below the level of the state (or the assemblage of governance systems in international society), civil society provides much of the social glue that holds governance systems together and allows them to operate effectively in a wide range of social settings.[42] Large challenges face those who seek to understand the role of civil society as a backdrop for the functioning of specific governance systems. It is difficult to find ways to pin down this concept for purposes of empirical analysis in any setting, much less to develop testable hypotheses about the role of civil society. Without doubt, these analytic challenges are even greater at the international or global level than at the domestic level. Yet it

seems increasingly clear that the costs of ignoring the role of civil society as a determinant of the effectiveness of environmental regimes—or international institutions more generally—will be great.

Institutional Linkages

Links to other regimes can cut both ways in terms of their impact on effectiveness. Until recently, students of international regimes exhibited a marked tendency to treat these entities as stand-alone arrangements and to conduct detailed case studies focused on individual regimes. Given the relative difficulty in grasping the concept of regimes and the complexity of specific arrangements, this practice is perhaps understandable. But with the increase in numbers of environmental regimes in international society, this procedure is no longer tenable. Institutional linkages are widespread, and they clearly make a difference in terms of the effectiveness of individual regimes. It is helpful to begin by drawing a distinction between horizontal linkages and vertical linkages. *Horizontal linkages* refer to connections between individual regimes and other institutional arrangements operating at the level of international society. Some observers have been struck by the dangers of individual regimes interfering with one another's operations in ways that reduce effectiveness; they have begun to speak of institutional overlap or congestion as a label for this phenomenon.[43] But the prospect of mutual reinforcement and other more positive connections seems equally important. This has given rise to an examination of nested regimes, as in the case of links between regional seas arrangements and the overarching law of the sea; clustered regimes, as in the case of the linked but differentiable components of the Antarctic Treaty System; and embedded regimes, as in the case of free trade arrangements embodying larger principles of the neo-liberal economic order.[44] It has also led to a consideration of structures of institutional arrangements and an examination of similarities and differences in structures of environmental institutions in contrast to economic institutions.[45]

Vertical linkages refer to connections between international regimes and institutional arrangements operating at lower levels of social organization. Many students of domestic institutions have observed that arrangements devised at the national level produce better results when they are compatible with regional or local practices than when they work at cross purposes with these practices. Studies of local arrangements centered on the use of common pool resources, for example, are replete with accounts of the disruptive consequences of national arrangements devised in ignorance of longstanding local procedures for 'governing the commons.'[46] The importance of these linkages is all the more important at the international level, where compatibility across several levels of social organization becomes an issue. Much of the criticism that has been leveled at the international regime for trade, currently embodied in the World Trade Organization, for instance, centers on claims pertaining to the destructive or exploitative impacts these global arrangements are alleged to have on the viability of longstanding resource regimes operating at regional and even local levels.[47] Our knowledge of such matters remains relatively superficial at this stage. But we already know enough to say that there is a need to devote much more attention to institutional linkages in future efforts to understand the sources of regime effectiveness.

Broader Setting

Regimes are highly sensitive to the larger settings within which they operate. International environmental regimes do not operate in a socioeconomic or biophysical vacuum. Rather, they arise and operate in settings that have obvious implications for their capacity to succeed in solving specific problems. Periods marked by economic recessions or depressions, for example, are likely to pose severe problems for efforts to solve environmental problems. The existence of political tensions or the occurrence of hostilities among key players exogenous to the environmental problems at hand are apt to overshadow efforts to solve environmental problems. Consider the extent to which broader political problems impede efforts to devise effective regimes for international rivers in areas such as the Middle East or the Indian subcontinent.[48] At the same time, there is much that we do not understand well in this area. Is regime effectiveness a function of the extent to which members have similar or homogeneous domestic political systems, and does it matter whether these systems are democratic in some meaningful sense of that term? Do regimes work better when their members have what are known as 'strong' states in terms of state-society relations?[49] Can effective regimes arise in situations in which their creators are motivated more by political concerns than by a desire to solve environmental problems as such? Are there ways to immunize regimes dealing with specific problems from fluctuations in broader political and economic relations among their members?

With regard to environmental regimes more specifically, it is critical to consider the relationships between the institutional arrangements themselves and the character of the ecosystems to which they relate. It is easy to speak, in general terms, about the need for congruence between regime features and ecosystem attributes. But what does this mean in practice? Some answers to this question are beginning to emerge.[50] The more resilient an ecosystem is, for instance, the less important it is to create monitoring mechanisms that can track changes in the system quickly and sensitively. The greater the homogeneity of the ecosystem, the less need there is for tailoring the components of a regime to the specific characteristics of the various subsystems that make up the overarching biophysical system. At the same time, it is clear that improving our understanding of the fit between ecosystems and institutional arrangements is a growth area in which the case is strong for investing resources intended to upgrade our ability to explain and predict the effectiveness of international environmental regimes.[51]

In closing this section, let me step back and endeavor to put these comments about the various sources of regime effectiveness into perspective. There is little doubt that regimes matter in the sense that they play a causal role in determining the content of collective outcomes at the international level. By itself, however, this observation is of limited interest. What makes the study of regime effectiveness both complex and challenging is the fact that institutions constitute only one of a set of social drivers that typically interact with one another as determinants of collective outcomes at the international level and that assume different values in individual cases. This makes it difficult to separate out the role of various categories of drivers and to assess just what proportion of the variance in collective outcomes is attributable to institutional arrangements in contrast to other factors such as material conditions and ideas.[52] It greatly reduces the prospects that

we can construct simple generalizations about the role of institutions couched in the form of statements specifying necessary or sufficient conditions for success in problem solving. And it raises questions about the extent to which it is helpful to treat some social drivers as underlying forces and others as intervening variables.[53] None of this means that international regimes are of only marginal significance when it comes to solving environmental problems at the international level. But it does mean that future efforts to gain ground in understanding the effectiveness of international regimes must tackle multivariate relationships head on and anticipate the prospect that the same factors, such as problem structure or regime attributes, that loom large under some conditions will produce no more than marginal effects under other conditions.

4. The Road Ahead

How can we go about improving our understanding of regime effectiveness? The answer depends, in part, on the objectives we are seeking to achieve. Our current understanding of effectiveness constitutes a good start toward illuminating this complex phenomenon. What is more, studies that pertain in one way or another to this subject constitute a growth industry among those interested both in international institutions and in environmental governance.[54] Yet from the point of view of learning how to design environmental regimes that have a reasonable prospect of solving the problems that motivate their creation, we have a long way to go. We know enough already, for instance, not to overlook matters of compliance in efforts to solve collaboration problems or to ignore problems of flexibility and learning in dealing with biophysical systems whose dynamics are poorly understood. But this is hardly sufficient to support a robust and reasonably successful effort to engage in institutional design in the realm of environmental governance.[55] Assuming that this line of inquiry is concerned not only with understanding environmental problems as an end in itself but also with solving them, how should we proceed?

In responding to this question, it is helpful to begin by drawing a distinction between two streams of analysis that merit sustained attention during the next phase of research on the effectiveness of international environmental regimes. One stream features an effort to consolidate and refine the existing body of ideas about effectiveness; the other calls for an effort to break new ground and, in so doing, to shift this field of study onto a higher level of understanding.[56] Much that we have learned about effectiveness is tentative or soft in nature. This is partly because many of the relationships in question have not been formulated with sufficient precision to allow for rigorous testing. We know that certain simple propositions about effectiveness, such as the notion that a dominant actor or a hegemon is necessary for regimes to prove successful, are not valid.[57] But this hardly licenses the conclusion that power in the structural or material sense is unimportant in accounting for the effectiveness of specific regimes.[58] What we need in this connection is a definition of power that is easy to operationalize, that avoids the pitfalls of circular reasoning, and that can be used in efforts to test a battery of specific hypotheses about the links between power and effectiveness.[59] Similar comments are in order about the role of epistemic communities in the operation of environmental regimes.[60] Clearly, the idea of epistemic communities has struck a responsive chord in the thinking of many observers

of environmental regimes, and it is relatively easy to point to specific cases in which groups exhibiting some of the characteristics of epistemic communities appear to have made a difference.[61] Yet the concept of an epistemic community has proven to be elusive when it comes to systematic empirical assessments. Observers frequently find themselves disagreeing not so much about the roles that epistemic communities play in actual cases as about whether or not we can say with certainty that an epistemic community is present. And these are not isolated examples. On the contrary, they exemplify a common problem plaguing efforts to turn interesting insights into a core of established propositions about the factors that determine the effectiveness of environmental regimes.

Where propositions have been spelled out with sufficient precision to allow for testing, moreover, we commonly discover that we are dealing with contingent relationships. It is relatively easy to disprove many—perhaps most—propositions about effectiveness stated as invariant relationships (that is, statements purporting to identify necessary or sufficient conditions for the achievement of effectiveness).[62] The presence of a dominant actor is not always critical to the achievement of effectiveness. The use of decision rules that call for consensus or even unanimity does not always pose a problem for effectiveness. Uncertainty is not invariably a pitfall that needs to be mitigated or even eliminated altogether in the interests of achieving effectiveness. Yet none of this means that we can dismiss factors such as the distribution of power among regime members, the nature of decision rules, and the state of knowledge about the problem at stake in our efforts to understand the determinants of effectiveness. What is needed is an effort to formulate a body of contingent propositions about such matters or, in other words, statements that both specify links and spell out as explicitly as possible the conditions or combinations of conditions under which these propositions can be expected to hold. Only in this way can we turn interesting speculation into usable knowledge about effectiveness.

These tasks of consolidation and refinement constitute a large and challenging research agenda for those interested in the effectiveness of international environmental regimes. We have made significant progress toward defining effectiveness, and taken some initial steps toward understanding the sources of effectiveness. With sufficient effort, this line of reasoning can yield a core of firmly established propositions that are useful to those responsible for designing or operating regimes. Impressive as it would be, however, this accomplishment would provide us with only a limited ability to make constructive contributions to the design and operation of effective environmental regimes. We need to extend and even redirect the study of effectiveness, to build on our initial accomplishments in order to move to a higher level of understanding of the sources of effectiveness.

Most students of effectiveness focus on states as the formal members of regimes and proceed to construct models in which these actors are treated as unitary and self-interested utility maximizers.[63] This procedure is a useful point of departure; additional insights may well flow from further work with such models. But to move forward in this field, we need to relax these behavioral assumptions in a controlled manner and to compare and contrast the insights that flow from a suite of differentiable models in contrast to a single stylized model. Three distinct steps seem particularly important to understanding the effectiveness of international environmental regimes. To begin with, we need to explore alternatives to utility maximization as sources of the behavior of regime members. This involves opening up this research program to what sociologists such as

Richard Scott call the normative and cognitive pillars of social institutions, and supplementing the logical rigor of economic models with the empirical insights of sociological analyses of institutions in the process.[64] A second step turns on relaxing the unitary actor assumption embedded in many behavioral models in this field of study. This leads to a consideration of what Robert Putnam and others have characterized as the logic of two-level games, a perspective that highlights bargaining over the terms of international regimes among different factions at the domestic level.[65]

The third step extends the analysis to include roles played by various nonstate actors in determining the effectiveness of environmental regimes.[66] Because most environmental regimes involve a two-step process in which states are the formal members but it is the behavior of a variety of other actors (such as corporations or even individual consumers) that actually causes the problems under consideration, those interested in international environmental regimes have recently directed attention to the efforts of states to implement commitments made at the international level as they apply to the behavior of private or semi-private actors operating under their jurisdiction.[67] But it is increasingly clear that nonstate actors, such as the DeBeers Corporation in the case of diamonds, the Chicago Board of Trade in the case of commodities, or Lloyds of London in the case of marine insurance, can become major players in international environmental regimes. There are even regimes of some significance in which states are not among the major players.[68] Needless to say, relaxing all these assumptions at once is a recipe for theoretical confusion. Yet we cannot hope to make a successful transition to the next level of understanding regarding the sources of regime effectiveness while we remain unwilling to modify conventional models that assume all the important actors are states that can be treated as unitary and rational utility maximizers.

Quite apart from these underlying theoretical concerns regarding actors and the sources of their behavior, there are a number of analytic issues that require attention in the next wave of studies of regime effectiveness. The preceding discussion made it clear that advancing our understanding of the effectiveness of regimes will require an analysis of multivariate relationships. In itself, this conclusion is unremarkable; similar observations are in order regarding many social phenomena. In the case at hand, however, severe limits on the use of most forms of statistical inference pose a major challenge. This is not to say that there is no place for inductive reasoning in the next phase of research on effectiveness. Several projects that apply such reasoning to good effect have recently been completed.[69] But this situation does lead to the conclusion that we need to engage in a sustained effort to understand the causal mechanisms or behavioral pathways through which regimes affect the behavior of various actors and, in the process, shape the content of collective outcomes in international society. Like other social institutions, regimes are not actors in their own right. Accordingly, they can affect the content of collective outcomes only by influencing the behavior of regime members or other relevant actors. How do they do this? One attempt to answer this question adopts a broadly utilitarian perspective and directs attention to what have become known as the three ‘Cs.’ Thus, regimes can increase the concern of relevant actors about the issues at stake, improve the contractual environment in the issue area, and enhance the capacity of key actors to carry out the terms of constitutional contracts.[70] Another important study seeks to expand the

range of behavioral mechanisms considered. It looks at regimes as utility modifiers, enhancers of Cupertino, bestowers of authority, learning facilitators, role definers, and agents of internal realignment.[71] Clearly, these studies constitute no more than preliminary forays into a complex subject. But they do point the way toward an important line of inquiry for students of regime effectiveness. Given the constraints on the use of inductive procedures, one way to proceed is to focus more attention on tracing the causal chains through which institutional arrangements impact the behavior of various actors and through such impacts affect the content of collective outcomes in international society. Among other things, this line of thinking is likely to prove particularly helpful to those concerned with practical matters of institutional design.

Whether the focus is on consolidation and refinement or on extension and redirection, those seeking to improve our understanding of the effectiveness of environmental regimes must come to grips with some important methodological problems. The most critical of these is undoubtedly the need to develop reliable and harmonized data sets that are easily accessible to those desiring to explore a variety of hypotheses dealing with the sources of institutional effectiveness. The current practice of relying on stand-alone case studies in which an individual regime is the unit of analysis has served us well; there is certainly room for more work of this kind in the pursuit of knowledge about effectiveness. Yet during the next phase a critical need will be a capacity to subject both specific hypotheses about determinants of effectiveness and alternative models of the role of regimes to systematic empirical examination based on evidence drawn from sizable numbers of cases.[72] Does the nature of the decision rules employed by environmental regimes make a difference in terms of effectiveness? What is the connection between the establishment of noncompliance procedures and effectiveness? Is the presence of nonstate actors among a regime's members significant when it comes to the achievement of effectiveness?

Answering questions of this type calls for the development of a database containing comparable information on as large a number of individual regimes as possible. The construction of such a database is an expensive proposition that is difficult to justify to funding agencies as an end in itself. Once in place, however, this database could become a public good available to all members of the relevant research community on convenient terms. Starting in 1993, the International Institute for Applied Systems Analysis (IIASA) supported an effort to develop an International Regimes Database (IRD) as part of its project on the Implementation and Effectiveness of International Environmental Commitments.[73] At this juncture, the IRD is still under construction, having outlived the IIASA project that gave birth to it, and it has found material support from other sources.[74] If my argument in this section is correct, the research community concerned with regime effectiveness has a compelling need for the continued development of the IRD or some reasonable facsimile thereof.

The research strategies outlined above offer no guarantee that we will succeed in developing a substantial collection of established propositions about the determinants of regime effectiveness. Much like the study of global warming, the theoretical, analytic, and methodological challenges facing students of effectiveness are great. But research in this field also resembles the study of climate change in the sense that the need for improved understanding is compelling and in that the problems of formulating useful answers are

worthy of the attention of the best and brightest analysts interested in international environmental issues. We have already made real progress in this field. But much remains to be done in order to arrive at results that will prove helpful to policymakers in a general way, much less serve as a useful guide for focused efforts in the realm of institutional design. Here, as elsewhere, the prizes will go to those who succeed in finding ways to overcome barriers involving causal inferences and to relax problematic assumptions embedded in current models without incurring undue losses of analytical rigor.

5. Conclusion

Since this essay is itself a survey of ongoing work pertaining to regime effectiveness, there is no need to summarize the contents of the preceding sections. But one point deserves special attention in these concluding paragraphs. What we can realistically hope for in this realm is an ability to act like physicians who develop superb diagnostic skills, rather than like chefs who are very good at following recipes. Although variations are certainly possible, recipes are expected to produce satisfactory results with a high degree of predictability and under a wide range of specific circumstances. In effect, they rest on a collection of statements spelling out sufficient conditions to transform collections of ingredients into finished products. The diagnostician, on the other hand, knows that there is a long list of factors that may play a role in explaining the condition of individual patients and that diagnoses based on necessary or sufficient conditions are few and far between. It is frequently possible to frame contingent or *ceteris paribus* propositions regarding the impacts of various factors and to observe complex interactions among a number of factors that are in play with regard to specific cases. But the role of the diagnostician is not to follow simple recipes that will ensure the health of individual patients. Rather, he or she must build up a convincing interpretation of each individual case based on considering a variety of factors that taken together appear to account for the condition at hand. The prescription then follows from this interpretive account.

Applied to international environmental regimes, these comments suggest that we should never expect to solve complex problems through applications of simple recipes. What works in dealing with marine systems may not work with atmospheric or terrestrial systems. What makes sense in dealing with both ecosystems and social systems that are highly resilient may not work with systems that are vulnerable to nonlinear changes. What proves effective in cases where the behavior of the relevant systems is well understood may not work in cases where our understanding of this behavior is limited and subject to rapid change. None of this is to suggest that analyses of the sources of institutional effectiveness have nothing to contribute to the initial design or subsequent modification of international environmental regimes. But it does suggest that the most useful contributions of regime analysis to solving large–scale environmental problems will take the form of interpretive accounts based on efforts to join general knowledge with an in-depth understanding of individual cases, in contrast to the application of simple recipes to complex problems of international governance.

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Notes

1. See Oran R. Young, ed., *Global Governance: Drawing Insights from the Environmental Experience* (Cambridge: MIT Press, 1997).

2. For an extended account of these conceptual matters, see Oran R. Young, International Governance: Protecting the Environment in a Stateless Society (Ithaca: Cornell University Press, 1994), chapter 6. This account draws distinctions among effectiveness as problem solving, effectiveness as goal attainment, behavioral effectiveness, process effectiveness, constitutive effectiveness, and evaluative effectiveness.

3. See Abram Chayes and Antonia Handler Chayes, *The New Sovereignty: Compliance with International Regulatory Agreements* (Cambridge: Harvard University Press, 1995); Edith Brown Weiss and Harold K. Jacobson, eds., *Engaging Countries: Strengthening Compliance with International Environmental Accords* (Cambridge: MIT Press, 1998); David G. Victor, Kal Raustiala, and Eugene B. Skolnikoff, eds., *The Implementation and Effectiveness of International Environmental Commitments* (Cambridge: MIT Press, 1998); and Kenneth Hanf and Arild Underdal, eds., *The Domestic Bases of International Environmental Agreements* (forthcoming).

4. A simple way to understand this point is to say that organizations are actors, while institutions are the rules of the game that circumscribe their activities. See also Helmut Breitmeier, 'International Organizations and the Creation of Environmental Regimes'; and M. J. Peterson, 'International Organizations and the Implementation of Environmental Regimes,' both in *Global Governance*, ed. Young, pp. 87–151.

5. For details on this case, see Edward A. Parson and Owen Greene, "The Complex Chemistry of the International Ozone Agreements," *Environment* 37 (March 1995): 16–20, 35–43.

6. The distinction between deterrence and compellence is discussed at length in Thomas C. Schelling, *Arms and Influence* (New Haven: Yale University Press, 1967).

7. For an account that emphasizes normative and cognitive sources of behavior, see W. Richard Scott, *Institutions and Organizations* (Thousand Oaks, Cal.: Sage Publications, 1995).

8. These concepts were introduced in David Easton, *A Systems Analysis of Political Life* (New York: Wiley, 1965).

9. On the idea of a transition from paper to practice, see Ronald B. Mitchell, *Intentional Oil Pollution at Sea: Environmental Policy and Treaty Compliance* (Cambridge: MIT Press, 1994).

10. For well-known examples pertaining to domestic systems, see Anthony Downs, *An Economic Theory of Democracy* (New York: Harper and Row, 1957); and James M. Buchanan and Gordon Tullock, *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (Ann Arbor: University of Michigan Press, 1962).

11. See Buchanan and Tullock, *The Calculus of Consent*; and Maurice Duverger, *Political Parties: Their Organization and Activity in the Modern State* (New York: Wiley, 1954).

12. Contrast this orientation with the new institutionalism in economics as described in Malcolm Rutherford, *Institutions in Economics: The Old and the New Institutionalism* (Cambridge: Cambridge University Press, 1994).

13. See Marc A. Levy, Oran R. Young, and Michael Zürn, "The Study of International Regimes," *European Journal of International Relations* 1 (1995): 308–12.

14. Conversely, nongovernmental organizations have played increasingly important roles in shaping the character of environmental regimes. On the idea of global civil society, see Paul Wapner, "Governance in Global Civil Society," in *Global Governance*, ed. Young, pp. 65–

84; and Ronnie D. Lipschutz, Global Civil Society and Global Environmental Governance (Albany: SUNY Press, 1996).

15. For an initial effort to develop such a scale, see Edward L. Miles et al., *Explaining Regime Effectiveness: Confronting Theory with Evidence* (forthcoming).

16. Compare the discussion of such matters in Gary King, Robert O. Keohane, and Sidney Verba, *Designing Social Inquiry: Scientific Inference in Qualitative Research* (Princeton: Princeton University Press, 1994).

17. To illustrate, a 1–5 scale of effectiveness might give a 5 to a regime that decisively solves the problem at stake, a 1 to a regime that is completely ineffectual, a 2 to a regime that is marginally effective, a 3 to a regime that produces substantial effects, and a 4 to a regime that is very effective without solving the problem altogether.

18. See also the rankings in Miles et al., Explaining Regime Effectiveness.

19. See Olav Schram Stokke and Davor Vidas, eds., *Governing the Antarctic: The Effectiveness and Legitimacy of the Antarctic Treaty System* (New York: Cambridge University Press, 1997); Lee Botts and Paul Muldoon, *The Great Lakes Water Quality Agreement: Its Past Successes and Uncertain Future* (Hanover, N.H.: Institute on International Environmental Governance, 1996); Jon Birger Skjaerseth, "Towards the End of Dumping in the North Sea: The Case of the Oslo Commission," in *Explaining Regime Effectiveness*, Miles et al.; and Parson and Greene, "The Complex Chemistry of the International Ozone Agreements."

20. See Simon Lyster, *International Wildlife Law* (Cambridge: Grotius Publishers, 1985); Weiss and Jacobson, eds., *Engaging Countries*; Miles et al., *Explaining Regime Effectiveness*; and M. J. Peterson, "International Fisheries Management," in *Institutions for the Earth: Sources of Effective International Environmental Protection* ed. Peter M. Haas, Robert O. Keohane, and Marc A. Levy (Cambridge: MIT Press, 1993), pp. 249–305.

21. Mitchell, *Intentional Oil Pollution at Sea*.

22. A number of examples are described in some detail in Lyster, *International Wildlife Law*.

23. See Steinar Andresen, "The International Whaling Convention," in Miles et al., *Explaining Regime Effectiveness*.

24. For a study of the European Long-Range Transboundary Air Pollution (LRTAP) regime, which began in 1979 with a framework convention that contained little substantive content, but which has evolved steadily over the years, see Marc A. Levy, "European Acid Rain: The Power of Tote-Board Diplomacy," in *Institutions for the Earth*, ed. Haas, Keohane, and Levy, pp. 75–132.

25. For prominent examples of the argument that international regimes are mere epiphenomena, see Susan Strange, "*Cave! hic dragones*: A Critique of Regime Analysis," in *International Regimes*, ed. Stephen D. Krasner (Ithaca: Cornell University Press, 1983), pp. 337–54; and John J. Mearsheimer, "The False Promise of International Institutions," *International Security* 19 (1994–1995): 5–49; together with the responses by Robert O. Keohane, Lisa L. Martin, Charles A. Kupchan, Clifford A. Kupchan, John Gerard Ruggie, and Alexander Wendt, and the rejoinder by Mearsheimer printed in *International Security* 20 (Summer 1995): 39–93.

26. Arthur A. Stein, "Co-ordination and Collaboration: Regimes in an Anarchic World," in *International Regimes*, ed. Krasner, pp. 115–40.

27. Ronald B. Mitchell, "Compliance Theory: An Overview," in *Improving Compliance with International Environmental Law*, ed. James Cameron, Jacob Werksman, and Peter Roderick (London: Earthscan Publications, 1996), pp. 3–28.

28. Kenneth A. Oye, "Explaining Cupertino under Anarchy: Hypotheses and Strategies," in *Cupertino under Anarchy*, ed. Kenneth A. Oye (Princeton: Princeton University Press, 1986), pp. 1–24.

29. Robert Axelrod, *The Evolution of Cupertino* (New York: Basic Books, 1984).

30. On the Tübingen approach, see Volker Rittberger and Michael Zürn, "Regime Theory: Findings from the Study of “East-West” Regimes," *Cupertino and Conflict* 26 (1991): 165–83. On the Oslo/Seattle approach, see Arild Underdal, "One Question, Two Answers," in Miles et al., *Explaining Regime Effectiveness.*

31. Oran R. Young, *International Society: Enhancing the Effectiveness of Environmental Governance Systems* (Ithaca: Cornell University Press, forthcoming), chapter 3.

32. Ronald B. Mitchell, "Regime Design Matters: Intentional Oil Pollution and Treaty Compliance," *International Organization* 48 (Summer 1994): 425–58.

33. For a general discussion of agency, see Gary Miller, *Managerial Dilemmas: The Political Economy of Hierarchy* (Cambridge: Cambridge University Press, 1992).

34. On systems of implementation review or SIRs, see Victor, Raustiala, and Skolnikoff, eds., *The Implementation and Effectiveness of International Environmental Commitments.*

35. On the distinction between management models and enforcement models of compliance, see Chayes and Chayes, *The New Sovereignty*.

36. For a general account of decision rules that contrasts the transaction costs of increasing the size of the majority needed to win with the welfare losses to those in the minority arising from reductions in the number needed to win, see Buchanan and Tullock, *The Calculus of Consent.*

37. Jacob Werksman, "Designing a Compliance System for the UN Framework Convention on Climate Change," in *Improving Compliance*, ed. Cameron, Werksman, and Roderick, pp. 85–112.

38. For a striking case in point involving pollock in the Bering Sea, consult William V. Dunlap, "Bering Sea," *The International Journal of Marine and Coastal Law* 10 (1995): 114–35.

39. For a case study that explores this theme in depth, see Botts and Muldoon, *The Great Lakes Water Quality Agreement.*

40. Contrast the economic perspective set forth in Rutherford, *Institutions in Economics*, with the sociological perspectives discussed in Scott, *Institutions and Organizations*.

41. See Wapner, "Governance in Global Civil Society"; and Lipschutz, *Global Civil Society*.

42. For a range of perspectives on civil society, see Jean L. Cohen and Andrew Arato, *Civil Society and Political Theory* (Cambridge: MIT Press, 1992). The idea of global civil society is discussed in Jessica T. Mathews, "Power Shift," *Foreign Affairs* 76 (January/February 1997): 50–66.

43. See Richard Herr and Edmund Chia, "The Concept of Regime Overlap: Identification and Assessment," unpublished paper, University of Tasmania, 1995; and Edith Brown Weiss, "International Environmental Law: Contemporary Issues and the Emergence of a New World Order," *Georgetown Law Journal* 81 (March 1993): 675–710.

44. An influential account of embedded regimes is John Gerard Ruggie, "International Regimes, Transactions, and Change: Embedded Liberalism in the Postwar Economic Order," in *International Regimes*, ed. Krasner, pp. 195–232.

45. Konrad von Moltke, "Institutional Interactions: The Structure of Regimes for Trade and the Environment," in *Global Governance*, ed. Young, pp. 247–72.

46. Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 1990). For a case study highlighting the disruptive consequences in question, see Narpat J. Jodha, "Property Rights and Development," in *Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment*, ed. Susan S. Hanna, Carl Folke, and Karl-Göran Mäler (Washington, D.C.: Island Press, 1996), pp. 205–20.

47. See David P. Ross and Peter J. Usher, *From the Roots Up: Economic Development as if Community Mattered* (Croton-on-Hudson, N.Y.: Bootstrap Press, 1986).

48. Peter H. Gleick, "Water and Conflict: Fresh Water Resources and International Security," *International Security* 18 (Summer 1993): 79–112; and Miriam R. Lowi, *Water and Power: the Politics of Scarce Resource in the Jordan River Basin* (Cambridge: Cambridge University Press, 1993).

49. On the distinction between "strong" and "weak" states, see Joel Migdal, *Strong Societies and Weak States: State-Society Relations and State Capabilities in the Third World* (Princeton: Princeton University Press, 1988).

50. See the papers included in Part I of *Rights to Nature*, ed. Hanna, Folke, and Mäler; and Fikret Berkes and Carl Folke, eds., *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience* (New York: Cambridge University Press, 1997).

51. Oran R. Young, ed., *Science Plan for the Project on the Institutional Dimensions of Global Change* (Bonn: IHDP, 1998).

52. See Oran R. Young, ed., *The Effectiveness of International Environmental Regimes.: Causal Connections and Behavioral Mechanisms* (Cambridge: MIT Press, 1999), chapters 1 and 5.

53. See, for example, Stephen D. Krasner, "Structural Causes and Regime Consequences: Regimes as Intervening Variables," in *International Regimes*, ed. Krasner, pp. 1–21.

54. See Weiss and Jacobson, eds., *Engaging Countries*; Victor, Raustiala, and Skolnikoff, eds., *The Implementation and Effectiveness of International Environmental Commitments*; Young, ed., *The Effectiveness of International Environmental Regimes*; and William C. Clark, J. van Eijndoven, and Jill Jaeger, eds., *Learning to Manage Global Environmental Risks: A Comparative History of Social Responses to Climate Change, Ozone Depletion, and Acid Rain* (Cambridge: MIT Press, forthcoming).

55. For a range of approaches to institutional design, see Robert E. Goodin, ed., *The Theory of Institutional Design* (Cambridge: Cambridge University Press, 1996).

56. I am indebted to Arild Underdal for calling my attention to this distinction.

57. Duncan Snidal, "The Limits of Hegemonic Stability Theory," *International Organization* 39 (Autumn 1985): 579–614.

58. See Arild Underdal, "Patterns of Effectiveness: Examining Evidence from Thirteen International Regimes," in Miles et al., *Explaining Regime Effectiveness*.

59. For an account that emphasizes the differences between power in the structural sense and bargaining power or leverage, see Young, *International Governance*, chapter 5.

60. Peter M. Haas, "Do Regimes Matter? Epistemic Communities and Mediterranean Pollution Control," *International Organization* 43 (Summer 1989): 377–403; and Ernst B. Haas, *When Knowledge is Power: Three Models of Change in International Organizations* (Berkeley: University of California Press, 1990).

61. See the essays collected in Peter M. Haas, ed., *Knowledge, Power, and International Policy Co-ordination* (Columbia: University of South Carolina Press, 1997).

62. Young, ed., *The Effectiveness of International Environmental Regimes*, chapter 5.

63. For a particularly clear example, see Miles et al., *Explaining Regime Effectiveness.*

64. Scott, *Institutions and Organizations*, chapter 3. A study that pursues this line of thinking regarding international regimes is Young, ed., *The Effectiveness of International Environmental Regimes.*

65. Robert Putnam, "Diplomacy and Domestic Politics: The Logic of Two-level Games," *International Organization* 42 (Summer 1988): 427–60; and Peter B. Evans, Harold K. Jacobson, and Robert D. Putnam, eds., *Double-edged Diplomacy: International Bargaining and Domestic Politics* (Berkeley: University of California Press, 1993).

66. Thomas Princen and Matthias Finger, *Environmental NGOs in World Politics: Linking the Local and the Global* (London: Routledge, 1994); Steve Charnovitz, "Two Centuries of Participation: NGOs and International Governance," *Michigan Journal of International Law* 18 (Winter 1997): 183–286; and Mathews, "Power Shift." A case study that helps to clarify the role of non-state actors in the operation of regimes is Lasse Ringius, "Environmental NGOs and Regime Change: The Cases of Ocean Dumping of Radioactive Waste," *European Journal of International Relations* 3 (March 1997): 61–104.

67. See Weiss and Jacobson, eds., *Engaging Countries*.

68. Studies of regimes in which some or all of the key players are nonstate actors include Debora L. Spar, *The Cooperative Edge: The Internal Politics of International Cartels* (Ithaca: Cornell University Press, 1994); Virginia Haufler, "Crossing the Boundary between Private and Public: International Regimes and Non-State Actors," in *Regime Theory and International Relations*, ed. Volker Rittberger (Oxford: Clarendon Press, 1993), pp. 94–111; and Virginia Haufler, *Dangerous Commerce: Insurance and the Management of International Risk* (Ithaca: Cornell University Press, 1997).

69. See especially Weiss and Jacobson, eds., *Engaging Countries*; Victor, Raustiala, and Skolnikoff, eds., *The Implementation and Effectiveness of International Environmental Commitments*; and Clark, van Eijndoven, and Jaeger, eds., *Learning to Manage Global Environmental Risks.*

70. The three "Cs" were introduced in Haas, Keohane, and Levy, eds., *Institutions for the Earth*; and used again to good advantage in Robert O. Keohane and Marc A. Levy, eds., *Institutions for Environmental Aid: Pitfalls and Promise* (Cambridge: MIT Press, 1996).

71. Young, ed., *The Effectiveness of International Environmental Regimes.*

72. A useful, though limited, start in this direction is made in Miles et al., *Explaining Regime Effectiveness*.

73. On the International Regimes Database, see Helmut Breitmeier, Marc A. Levy, Oran R. Young, and Michael Zürn, "International Regimes Database (IRD): Data Protocol," International Institute for Applied Systems Analysis, WP-96-154; and Helmut Breitmeier, Marc A.

Levy, Oran R. Young, and Michael Zürn, "The International Regimes Database as a Tool for the Study of International Cupertino," International Institute for Applied Systems Analysis, WP-96-160.

74. Funding for the database now comes from the National Science Foundation (NSF) in the United States and the German Science Foundation (DFG).

Director, Institute on International Environmental Governance, Dartmouth College.

Appendix II

The Study of Regime Effectiveness

Agenda-Setting Paper for the Concerted Action Workshop, 16-18 October, 1998

Arild Underdal, with contributions from Matthijs Hisschemöller, and Konrad von Moltke

1. Purpose and scope

The purpose of this short paper is to identify a set of common and important cutting-edge questions that can serve as agenda items for the Concerted Action programme. In this effort we build on several excellent state-of-the-art reviews covering regime analysis more generally (notably Levy, Young and Zürn, 1995; Hasenclever, Mayer and Rittberger, 1997; and Young, 1998a). This paper is *not* another comprehensive assessment; we assume that at least one of the reviews mentioned above is known to all participants. Our ambition here is limited to providing a framework for a focused discussion of Concerted Action priorities without in any way closing the agenda. We try to do so by delineating a set of general and fundamental questions that any study of regime effectiveness will have to wrestle with and that the field at large tries to answer. We invite you to read the paper with a view to exploring how your own work relates to one or more of these questions, and to use it as a framework for identifying important gaps or thinking about future priorities and research strategies.

2. The *dependent* variable: defining and measuring 'effectiveness'

International regimes may be evaluated by a range of different standards, including effectiveness, efficiency, fairness/equity, robustness, and legitimacy. In this Concerted Action programme we have focused on 'effectiveness'. A good place to start may therefore be to pose two questions about our dependent variable: (i) what precisely do we mean by 'regime effectiveness'? and (ii) how can we go about measuring the 'effectiveness' of an international environmental regime?

As a first cut, an international regime can be considered 'effective' to the extent that it successfully performs a particular (set of) function(s) or solves the problem(s) that motivated its establishment. Although useful as a point of departure it soon becomes clear that this definition is not sufficiently precise to serve as an operational tool in comparative empirical research. Even though important progress has been made over the past several years, more conceptual groundwork is needed to sharpen our definition(s) of 'effectiveness' and even more so to develop strategies and tools for measurement. More precisely, there seems to be at least three basic questions that students of regime effectiveness will have to address: (1) What precisely constitutes the *object* to be assessed? (2) Against which *standard(s)* is this object to be evaluated? (3) What kinds of *measurement operations* do we have to go through in order to be able to attribute a certain score to a particular regime?

The first of these questions may at first thought appear trivial: clearly the object must be the regime in focus! Although correct in itself, this answer is not particularly helpful. A regime can be evaluated on the basis of the norms, principles and rules constituting its

substantive contents *(output*, in the terminology of Easton (1965)), or on the basis of the consequences flowing from the implementation of and adaptation to these norms and rules. Whenever we are dealing with environmental regimes, the latter may be further specified by making a distinction between influence on human behaviour *(outcome)* and consequences for the state of the biophysical environment itself *(impact*). Presumably, the latter is our ultimate concern, but impact on the environment can in many instances be assessed only years or even decades after the regulations were established. In the meanwhile the best we can do is to focus on one of the preceding stages.

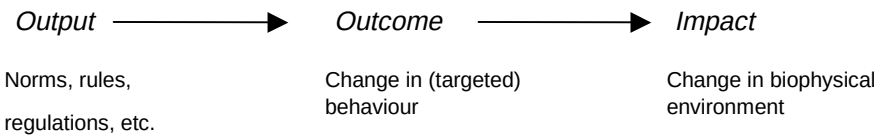

Figure 1 Environmental Regimes as Objects of Assessment

The score we would assign to a particular regime may well depend on which of these foci we adopt. A regime that appears 'effective' judged on the basis of its formal rules and regulations may turn out to affect human behaviour only marginally or in unexpected directions. Moreover, if the problem diagnosis on which the regime is premised is inaccurate, even a regime that succeeds well in changing human behaviour as intended may fail to lead to the improvement expected in the state of the environment. Thus, regulations successfully reducing emissions of SO_2 will affect the health of forests or waterways only to the extent that the environmental damage we want to prevent is indeed caused by SO_2 emissions. Most studies of regime effectiveness seem to focus on behavioural change, which can be seen as the intermediate link between policy and the environment.[4] The general notion of effectiveness is, however, open to different interpretations. The basic implication of this ambiguity is simply that we need to specify explicitly and carefully *what* our effectiveness scores refer to – the principal options being formal rules and regulations, actual change in human behaviour, or change in the state of the environment itself.

Most assessments of regime effectiveness also seem to focus on 'gross' rather than 'net' achievement, leaving out the *transaction costs* involved in establishing and operating the regime.[5] Moreover, most assessments seem to focus on problem-solving in a rather narrow sense, leaving out various kinds of *side effects* generated by the formation or opera-

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[4] One reason why political scientists tend to focus on outcomes is that a regime that succeeds in changing human behaviour as intended has achieved its first order objective and hence can be considered effective in terms of *governing society*. If it still falls short of achieving its *ultimate* objective, that failure must be attributed to deficiencies in *'knowledge*-making' rather than in *policy*-making. Political science is concerned (primarily) with the latter.

[5] Besides, there seems to be a widespread inclination to build in an implicit assumption that the worst that a regime can accomplish is *nothing* (=*zero* effectiveness). It is abundantly clear, however, that there is a very real possibility that a regime may have a *negative* effect – even before we include transaction costs in the equation. By implication, our scales will have to allow for negative scores. The need to look more carefully at negative regime effects is underlined in i.e. Ringius (1997) and Miles et al. (forthcoming).

tion of regimes. We see nothing inherently wrong in these conceptualisations, as long as their implications are clearly understood. We should realise, though, that neglecting transaction costs is likely to lead us to *over*estimate the social benefits produced by a regime, while leaving out side-effects probably by and large leads to the opposite bias. A comprehensive assessment of the net social benefits generated by a particular regime *(E_i)*, including the efforts to establish and operate it, would require that we solve something like the equation below:

$$E_i = (S_i \cdot K_i) + B_i - C_i$$

where:

S_i = the stringency of regime rules and regulations (output);

K_i = the level of compliance with these provisions;

B_i = side effects of regime formation and operation; and

C_i = the transaction costs of these processes.

Moreover, a comprehensive research agenda would include efforts to examine the relationship between or among some of these components. For example, except for regimes dealing with (pure) co-ordination problems, we may – ceteris paribus – expect the level of compliance to decline as regime rules and regulations become more 'demanding' (see Downs, Rocke, and Barsoom, 1996). Other things being equal we may furthermore expect transaction costs to be higher for a demanding regime than for regimes that are closer to 'the non-co-operative equilibrium'. A cynic might even argue that aggregate *net* benefits tend to be constant (and, even worse: close to zero)[6]; whatever is gained at the regime formation stage in terms of more ambitious rules or targets tend to be offset by a lower level of compliance and higher transaction costs!

To assign a score of effectiveness to a particular regime, we need a point (or trajectory) of reference against which actual achievement can be compared. At the most general level there seems to be two basic alternatives (Underdal, 1992). One is the hypothetical state of affairs that would have come about had the regime not existed. Adopting this point of reference we would conceive of effectiveness in terms of (relative) improvement. This is clearly the notion we have in mind when considering whether a regime 'matters'. The other option is to evaluate a regime against some idea of what constitutes the 'ideal' solution (the 'collective optimum'). This is the appropriate standard if we want to know to what extent a problem is in fact 'solved' under the present arrangements. The two notions can easily be combined, as suggested by Helm and Sprinz (1998). Their formula conceives of effectiveness in terms of the extent to which a regime has *in fact* accomplished all that *could* be accomplished:

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[6] A well-known Norwegian economist 'derived' what is sometimes referred to as the 'iron law of bargaining', saying that inherent in the process of bargaining are mechanisms that tend to block or spoil the joint gains that it is intended to tap (Johansen, 1979).

regime solution – non-co-operative outcome

optimal solution – non-co-operative outcome

Determining the non-co-operative outcome or the optimal solution poses intriguing methodological challenges. In a non-experimental real-world setting the question of what would have happened in the absence of a regime can be answered only through counterfactual reasoning. Conventional approaches include extrapolating current trends or taking the situation that existed immediately before the regime took effect as the baseline, but both methods are fraught with problems and pitfalls. Determining the collective optimum – the maximum that could have been accomplished – is usually even more difficult. In some cases, notably for regimes designed to manage living resources, we may be fortunate enough to find explicit expert advice that we take as a point of departure. Most often, however, the expert assessments available to us do not exist in a standardised 'ready for use' format. Moreover, particularly for issues characterised by conflict over values, the task of determining the 'optimal' solution cannot be reduced to a purely technical exercise such as estimating the maximum sustainable yield of a particular stock. Thus, the key issue occupying the International Whaling Commission is not how much the various whale stocks can take but rather whether or not it is morally wrong to kill whales for human consumption *regardless* of stock abundance. Judging a regime by its performance in accomplishing its own officially declared purpose is probably the best way of hedging against completely arbitrary standards based on the observer's own ideas about what is good and bad. We should nonetheless realise that whenever the purpose itself is contested *any* assessment of effectiveness is likely to be equally controversial, at least on *normative* grounds.

Finally, any assessment of effectiveness implies a *causal inference*.[7] When we say that a particular regime is 'effective' we *attribute* some consequence(s) *to* the existence or functioning of that regime. In most cases human behaviour and the state of the environment are subject to the influence of a wide range of other factors as well. To give just one example, a reduction in the emission of certain pollutants may well be caused by technological development, changes in relative prices of products or input factors, or by economic recession. Separating the impact of a regime from the impact of such 'exogenous' developments is often a very difficult task, in part because the regime may interact with exogenous factors. For students of regime effectiveness there is, however, no escape. We therefore need to think hard about methodological approaches and techniques that can help us make sensible and reliable inferences about cause-effect relationships.

For purposes of systematic comparative or statistical research, conceptual congruence and inter-calibration of measurement methods are important requirements. For the field at large, however, any attempt at authorising one particular conceptual framework or one method of measurement would, at least at this stage, be a futile and doomed exercise. A more sensible and realistic objective seems to be to work together to enhance *precision* and *transparency* so that we can at least distinguish *substantive* from terminological or technical differences. A critical examination of work completed or in progress from this perspective might help us see more clearly where we 'agree' and where we 'disagree',

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[7] This applies at least in so far as the assessment refers to *outcome* or *impact*.

and – perhaps – also help us learn from what seem to be particularly promising approaches.

3. Independent variables: what determines regime effectiveness?

Why are some international regimes more effective than others? At the most general level, there seems to be two basic answers. One seeks the explanation in characteristics of the *problem* addressed, the basic proposition being that some problems are intellectually less complicated or politically more 'benign' than others and hence easier to solve. The main research challenges are (a) to specify what exactly makes a problem difficult or easy to solve, and (b) to determine how much difference variance in problem type makes with regard to regime effectiveness. The other path focuses on the 'supply side', more precisely on the *capacity* of a system to 'solve' various kinds of problems. The general argument is that some problem-solving efforts are more successful than others because more potent tools are being used or because the problem is attacked with greater skill or energy. The challenges here are (a) to specify what determine problem-solving 'capacity', and (b) to explore how much of the variance in effectiveness can be attributed to variance in 'capacity'.

3.1 Type of problem

Several problem typologies have been suggested in previous research. Hasenclever, Mayer and Rittberger (1997) sort these contributions into two broad categories, one focusing on the basic contents of issues or issue-areas, the other on more specific configurations of preferences in collective action situations (see below).[8]

'Problem structure'	'Situation structure'
• Substantive problem-areas characterised in terms of the basic value at stake, such as security, economic well-being, etc. (Ex.: Czempiel, 1981) • Objects of contention. (Ex.: Rittberger et al., cf. Rittberger, 1993) • The degree of congruity between individual and collective costs and/or benefits (Ex.: Underdal, 1987; Miles et al., forthcoming)	• Applies game theory models to distinguish different kinds of collective action situations (Ex. Stein, 1982; Zürn, 1992)

Several observations can be made about this path of research. First, even though no straightforward method exists for translating one of these typologies into another, we can easily see that they are related. The main common denominator is that they all conceive of regime formation and effectiveness as a function of the *kind of values* or *configurations of interests*.[9] In other words, they agree that the values or interests at stake provide important clues for understanding international co-operation. They diverge, however,

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[8] This is by no means an exhaustive typology. In addition, we have some interesting studies focusing on what we might call 'intellectual' aspects (such as the amount of uncertainty pertaining to problem diagnosis and the effects of alternative 'cures'), or on the interface between 'intellectual' and 'political' dimensions (see i.e. Hisschemöller and Gupta, forthcoming).

[9] This is the defining characteristic of the so-called 'interest-based 'approach.

when it comes to conceptualisation and taxonomies. Second, research examining the significance of problem or situation characteristics has generated a set of relatively precise propositions. Game theory offers the most precise models and the most conclusive results, but also the approaches developed by i.e. the Tübingen and Oslo/Seattle 'schools' offer substantial guidance in linking problem types to outcomes. For example, the Tübingen 'school' distinguishes four basic 'objects of contention', and hypothesise that the prospects of co-operative solutions decline in the order indicated below:

Conflict of *interests* pertaining to *absolutely* assessed goods	(1)
Conflict over the means to obtain certain values	(2)
Conflict of interests pertaining to *relatively* assessed goods	(3)
Conflict over values	(4)

Third, empirical studies provide a fair amount of support not only for the underlying assumption that problem type 'matters' but also for several of the more specific hypotheses that have been suggested (see i.e. Efinger, Mayer and Schwarzer, 1993; Andresen and Wettestad, 1995). In an overall assessment we can therefore at the very least conclude that, taken together, these various contributions demonstrate (1) that problem type is an important determinant of co-operative achivements and a promising focus of research, and (2) that at least some of the typologies developed discriminate reasonably well between problems that are easy and problems that are hard to solve.

Having said that, we should recognise that a considerable amount of work needs to be done before we can claim to have a well-developed *theory* specifying precisely how particular problem characteristics affect international (environmental) co-operation. This Concerted Action programme could conceivably contribute on at least two fronts. First, more conceptual groundwork is needed to determine precisely where the various typologies overlap and differ in substantive contents. For example, it seems that the so-called 'problem-structural' approaches on the one hand and 'situation-structural' schemes on the other operate at different levels of *specificity*. To the extent that this is the case, they can be seen as complementary rather than competing schemes – the former applying to broad categories of problems, the latter to more specific strategic choice situations. This line of reasoning suggests that we might be well advised to use schemes such as those developed by the Tübingen or the Oslo/Seattle team to describe the basic (incentive) structure of a problem and then move on to apply game theory models to analyse more well-defined strategic choice situations. The various typologies seem, however, to differ also in other respects. For example, they seem to be 'situated' in different research traditions. The 'situation structure' approach and that of the Oslo/Seattle team are clearly framed in terms of rational choice analysis, while those suggested by Czempiel and Hisschemöller & Gupta seem to be rooted in a 'sociological' perspective. To the extent that a particular taxonomy is embedded in a particular conception of agent-structure relationships it may well function adequately only within that basic framework. The general point to be made here is simply that in order to be able to 'couple' propositions and findings from the various projects we need to understand more precisely how the different schemes relate to each other. Again, the main purpose of such an exercise would be to

enhance precision and transparency and facilitate effective communication; we are *not* in the business of authorising one particular scheme as 'the approved taxonomy'.

Second, more systematic *empirical* research is needed to determine more precisely *how* variance in problem characteristics affect (the outcome of) regime formation and implementation processes, and good reasons can be given for treating these stages as different and sequentially coupled 'games' (Young, 1998b). More specifically, there are at least three different challenges to be met. One is to move from (largely) *bi*variate to more elaborate *multi*variate analysis. This is a critical step we need to take in order to be able to separate more reliably the impact of problem characteristics from the impact of other factors. Another is to explore in greater depth possibilities of *interplay*; i.e. try to determine to what extent and how problem characteristics and capacity components interact in shaping outcomes (see below). Third, if we are to succeed in taking these steps, we will have to expand our methodological repertoire in at least two directions: we shall have to supplement single-case studies with 'larger-N' studies, and supplement the prevailing 'historical' mode of study with methods that permit us to undertake more systematic and transparent multivariate analysis.[10] Taken together these challenges amount to a fairly demanding agenda!

3.2 Capacity

It seems fair to say that at this stage we know more about what makes a problem easy or difficult to solve than about what determines our ability or capacity to cope with it. In fact, the concept of 'capacity' is itself a rather elusive notion, used here only as a 'conceptual umbrella' covering a wide range of 'supply side' factors. Any specific study can deal only with a subset of these factors. A good place to start may be by trying to identify the principal elements. When we begin to think about which elements to include we will, however, soon discover that 'capacity' can be determined only with reference to a particular category of functions or tasks. Different tasks to some extent require *different* capabilities and skills. Even worse: what serves as an important asset in one setting may well turn out to be counter-productive in another. Coercive power is a case in point. The upshot of all this is that 'capacity' is a very complex concept calling for careful specification and inviting contingent and carefully contextualised statements only.

Complexity should, however, not be accepted as a legitimate excuse for paralysis. Particularly for those of us who would like to think that research can generate knowledge that decision-makers can use as inputs for designing or negotiating international regimes, understanding what determines the ability of international society to cope with different kinds of problems should be a high priority item. Let us therefore take some time to consider how we might approach the challenge of examining the political dimensions of problem-solving 'capacity'.[11]

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[10] Please note that we use the word *supplement*. We do believe that 'conventional' single-case studies have a lot to offer; what we are saying is that for some analytical purposes we will need the distinctive contributions of other approaches as well.

[11] The general notion of 'capacity' includes also *intellectual* components that we do not explore in this paper.

This brings us back to the task of identifying the major determinants of capacity. A crude first cut may be to draw a distinction between *endogenous* and *exogenous* determinants. The former category includes characteristics of the regime itself and the institution through which it was established, the latter characteristics of the broader political, economic and social setting in which the regime was formed and subsequently operates. As these formulations suggest, we will have to consider endogenous as well as exogenous factors in two different stages; the stage of regime formation and that of operation/implementation. The capacity formula may well have to be differentiated by stage (cf. Young, 1998b).

3.2.1 Endogenous (institutional) factors

What a regime accomplishes is to some extent dependent on its *contents* and *form*. In sequential order, the research challenges are to determine (1) how the institutional setting through which the regime was established influenced its contents and form, and (2) how its own substantive provisions and organisational set-up in turn affect its performance.

The former challenge calls for efforts to study institutions as *arenas* and organisations as *actors*. Arenas regulate the access of actors to problems and the access of problems to decision opportunities ('games'). Arenas differ in terms of, inter alia, rules of access, decision rules, rules of procedure, and informal 'culture'. One of the tasks before us is to examine how these rules and norms influence the process of regime formation. This process often takes place under the auspices and with the assistance of an international organisation, and the outcome may well be affected by official purpose as well as the structure and capabilities of that organisation.[12] To qualify as an actor in its own right an organisation must have a minimum of unity, autonomy (vis-à-vis other actors, notably member states), resources, and external activity. International organisations vary substantially in terms of scores on these dimensions. One obvious candidate for a top score would be the EU. By contrast, most secretariats serving international environmental regimes find themselves close to (and in some cases *below*) the critical minimum needed to be recognised as political actors. The general question raised by these observations may be formulated as follows: what difference does the actor capacity of the 'sponsoring' organisation make for the formation of environmental regimes?[13]

Similar questions can be raised with reference to the stage of *implementation.* Even well-established global economic institutions, such as GATT and the proposed MAI are remarkably sparse in terms of institutional instruments, particularly when seen in relation to the complexity of the problems they are established to cope with. Somewhat surprisingly, many environmental regimes employ a much wider range of institutional mechanisms to achieve their goals. There are good reasons to believe that the institutional in-

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[12] Just think about the divergent preferences concerning the role of GATT/WTO vs. UN organisations such as UNCTAD and UNCED as arenas for negotiating global agreements affecting trade and investment as well as development and/or the environment.

[13] Interest in organisational seems to be fairly low among students of international environmental regimes. One reason may be that organisational variables are not considered important determinants of outcomes. Moreover, regime analysis developed to some degree as an attempt to move beyond what was seen by many as a somewhat sterile preoccupation with formal organisational arrangements.

strumentarium at disposal in the operation stage may be an important determinant of regime performance.

Once a regime is in place a host of new questions pertaining to *substantive* rules and regulations arise. For example, (under what circumstances) are regimes relying on regulation by incentive more effective than those relying on regulation by directive? How important are various kinds of selective incentives or differentiation of obligations in enticing reluctant states to join a regime and comply with its provisions? How does the legal status of a regulation – or the existence of performance monitoring and review procedures – affect compliance? These and similar questions are studied in considerable depth in economics, law, and to some extent also political science. Good answers would be of great practical interest to decision-makers and stakeholders. At this stage it seems, however, fair to say that the answers we can provide are neither fully consistent nor sufficiently well differentiated (and the former may in part be a consequence of the latter). It seems abundantly clear that many policy instruments work 'well' only in particular circumstances. Additional work is needed in order to specify those circumstances more precisely, and to come up with more sophisticated, *contingent* generalisations (see Efinger, Mayer and Schwarzer, 1993). Hopefully, this Concerted Action programme can offer a conducive, multidisciplinary setting for thinking about how we can stand up to this challenge.

3.2.2 'Exogenous' factors

A host of 'exogenous' factors – notably characteristics of the political, economic or social system in which a regime is situated – influence its effectiveness. At least four of these seem to merit particular attention: the distribution of power among the Parties involved, the amount of skill and energy available for 'engineering' co-operative solutions, the sense of 'community' within the system or group, and interplay with other institutions.

The distribution of power

The more demanding the decision rule, the more critical becomes leadership of one kind or another. And the weaker the 'systemic' capacity for monitoring and enforcing compliance, the more important becomes the power that one or a few *Parties* can mobilise in support of the regime. The common denominator for the so-called 'power-based' approaches is the assumption that the 'strength' of a regime depends on the extent to which it satisfies the interests of powerful actors. This line of reasoning led to what is known as the 'hegemonic stability' hypothesis, saying – in essence – that a 'unipolar' distribution of power, i.e. the existence of one dominant actor ('hegemon'), is a necessary condition for the establishment and maintenance of effective international regimes. Recent research has produced substantial empirical evidence indicating that this hypothesis is *not* tenable (see i.e. Young and Osherenko, 1993; Efinger, Mayer and Schwarzer, 1993). This conclusion should not, however, lead us to infer that the distribution of power is therefore irrelevant to regime effectiveness. Rather, the main implication seems to be that a more sophisticated analytical framework is needed to determine the impact of power. One step in that direction could be to link the distribution of power to the configuration of interests. Intuitively, we would expect concentration of power in the hands of the 'laggards' to yield less 'progressive' and effective regimes than a similar concen-

tration in the hands of the 'pushers'. Preliminary results from the Miles et al. project strongly support this general hunch. Conceptualised in such terms the distribution of power in fact comes out as the most important determinant of effectiveness in dealing with politically 'malign' problems. Interestingly, the same study indicates that power is of little or no relevance in handling problems categorised as 'benign'.

Skill and energy

Good solutions are rarely if ever simply 'there'; they often have to be invented or designed and then marketed or brokered to the *Parties* involved. The more skill and energy available for these tasks, the more likely it seems that they will be successful. Research on international co-operation provides ample support for the proposition that *intellectual* or *entrepreneurial* leadership can be a critical determinant of 'success' in international negotiations (see i.e. Young, 1991). At the same time, we should recognise that these modes of leadership are notoriously elusive (although fascinating) subjects of study, ideally requiring in-depth empirical analysis of interaction that often takes place behind closed doors. This is probably one reason why we still have a long way to go before we can claim to understand well the sources, techniques, and significance of the intellectual and entrepreneurial modes of leadership. We surmise, though, that there may be a reservoir of interesting observations 'hidden' in disparate case-studies undertaken primarily to answer other questions. If we are right, this Concerted Action programme may provide opportunities for comparing notes and developing a strategy for tapping into this reservoir.

Over the past ten to fifteen years several major studies have been published enhancing our understanding of the role of (consensual) knowledge as a basis for international co-operation and of the role of transnational networks of experts (known as 'epistemic communities') in transforming (science-based) knowledge into premises for policy decisions (E.Haas, 1990; P. Haas, 1990). Yet important questions call for further study. We know that science-based knowledge often plays an important role in policy-making processes, not least in environmental affairs. We also know, however, that the process of transforming such knowledge into policy premises can be a very complex and delicate exercise, and that there is no straight path leading from scientific consensus on 'facts' to political consensus on action. The simple 'enlightenment' notion casting science in the role of the wise leading the blind is in important respects misleading (see i.e. Jasanoff, 1990; Boehmer-Christiansen, 1997). The science-politics interface and the link between 'knowing' and 'doing' are highly complex relationships that we do not yet understand well. Moreover, most of the previous research in this field focuses on the role of knowledge and epistemic communities in regime *formation*. More work is needed to determine whether and to what extent the results reported for that stage can be extended also to regime effectiveness.

The sense of community

One of the basic propositions of the 'constructivist' approach is that *identity* shapes *preferences* (Wendt, 1992:398). Scholars working within other traditions concur that the strength of the sense of community *(Gemeinschaft)* within a group tends to affect it capacity for collective action. Several mechanisms seem to be at work here. Constructivists would emphasise the social construction of identity (the growth or strength of a sense of 'we-ness'). Rational choice scholars would point out that in stable and close relation-

ships actors will be induced to adopt a long-term perspective (extend 'the shadow of the future') (i.e. Axelrod & Keohane, 1985), and shift from a specific to a more diffuse interpretation of the norm of reciprocity (Keohane, 1986).

The interest in community or identity as a basis for international co-operation leads directly to an interest in the role of civil society. A substantial amount of practical experience suggests that many environmental regimes at all levels of governance are dependent upon the active participation of societal actors such as industry and commerce, environmental NGOs, and the media (see i.e. Lipschutz, 1996) In the study of international regimes the role of civil society is, however, still a fairly new and underdeveloped field of research, calling for additional investment in conceptual groundwork to develop analytic tools and models as well as for more systematic empirical analysis.

Interplay

Most assessments of international regimes consider these institutions as stand-alone arrangements. However, environmental regimes do not exist in a vacuum. For one thing, environmental damage most often occur as an unintended side-effect of other perfectly legitimate activities (such as industrial production, transportation of people and goods, etc.). In order to succeed, environmental policy must therefore somehow '*penetrate*' those systems of activities that cause damage to the environment. Moreover, in some cases environmental regimes are deliberately 'nested' in the sense that one builds upon another. The general implication of these observations is that the effectiveness of a particular environmental regime will in many instances be heavily dependent upon activities managed by other regimes as well as upon the performance of these other institutions. As a consequence, many environmental regimes can be adequately understood only *in a contextual perspective.* Regime *interplay* thus represents an important – and hitherto also a somewhat neglected – subject of analysis.

It is hardly feasible to include all linkages and relationships in an assessment of regime effectiveness (for an inventory, see Young, 1996). There seem, however, to be at least two types of relationships that merit particular attention. One might be referred to as the problem of 'embeddedness', the other is the relationship of international environmental regimes with regimes governing international economic activities.

Many environmental regimes are embedded or nested in the sense that they form part of an institution whose goals are wider than those of environmental management or sustainability. The regulations adopted and managed by the EU are probably the most obvious examples. In general, the effectiveness of an 'embedded' regime will at least to some degree depend upon the effectiveness of the institution to which it 'belongs'.

Most environmental regimes have economic impacts. As a consequence, conflicts between environmental regimes and economic regimes abound – ranging from the attempts to refocus the World Bank on sustainable development to the problems associated with structural adjustment programs sponsored by the IMF and the World Bank, to the increasingly fraught relationship between trade and investment on the hand and environmental quality on the other. Mapping these relationships and determining their significance represent major challenges for any assessment of the effectiveness of international environmental regimes.

Taken together, these observations suggest not only that the effectiveness of an environmental regime will in many instances depend on its relationships with other institutions; they also point towards a new front of research, where *systems* or *complexes* of interrelated institutions rather than individual regimes are in focus. It goes without saying that the task of assessing the 'effectiveness' of such institutional complexes confronts us with a host of new questions that students of international regimes have only began thinking seriously about. A substantial amount of conceptual groundwork may be needed before we have a solid platform for engaging in cumulative empirical research in this area.

4. Regime domains: global, regional, EU

This Concerted Action programme is designed to cover environmental regimes at three different levels: global, regional, and intra-EU. The basic assumption behind this set-up is that the three domains differ in important respects, and that additional mileage might be gained by systematically comparing these three categories with regard to variance in regime effectiveness and the *mechanisms* influencing their performance.

The three domains differ in at least three important respects. One is with regard to *the number and heterogeneity of Parties*. A plausible assumption is that the larger the number of *Parties* and the greater the heterogeneity of the group the less likely that joint problem-solving efforts will be successful. Recent studies suggest, however, that there is more to be said about this question (see Keohane & Ostrom, 1995). Another important difference pertains to *institutional capital* in the form of i.e. decision rules facilitating collective action, the organisational capacity of secretariats and other bodies, etc. In this regard the EU clearly stands out as unique – because of its democratic basis, its decision rules, its financial instruments, its administrative apparatus, and its legal powers. A third area where we would expect to find significant differences is in the *sense of community* existing within the various groups of *Parties*. Here we would definitely expect global regimes to obtain a low score, while the EU and some regional groupings aspire to a high score. Given the organisational set-up of our workshops and meetings, one challenge for the co-ordinating group will be to design procedures enabling us to compare notes across groups and thus systematically explore the impact of these and other differences for regime effectiveness.

5. Research strategies

We end this paper with a couple of ecumenical remarks about 'paradigms' and methods. The study of international regimes draws upon at least two major strands of social science theory; rational choice models of collective action and strategic interaction, and social-practice models rooted in sociology and social anthropology. In our view both of these traditions have important contributions to offer. By implication, we see no reason to engage in some kind of intellectual crusade on behalf of one or the other; clearly, neither provides *the* complete framework for understanding international institutions. At the same time, we should appreciate that their contributions are not only different, but to a significant degree also *incommensurable*, meaning that they cover different 'domains'. This suggests that we should have modest ambitions for integrating the two approaches, and also that efforts at 'forcing' the insights of one upon the other (through the familiar 'but-you-have-not-considered-X' kind of critique) will most often not be a particularly

productive exercise.[14] This is, of course, not to say that learning cannot occur *across* paradigms, nor that theory elements from different paradigms can never be combined. The argument is simply that the fact that they are working from different basic assumptions, are focusing on different mechanisms, and use different analytic tools is exactly what enables each of them to offer insights that the other cannot provide.

Finally, a plea for *expanding our methodological repertoire*. The study of international environmental regimes has in the past relied heavily on single-case studies, using the tools of 'traditional' qualitative analysis. This approach has generated very important insights in the past, and is likely to continue to do so in the future. As the field develops, however, we will more often be able to formulate – and also be 'forced' to address – demanding questions that can be answered only through systematic multivariate analysis, directed at precisely formulated 'strategic' research questions (cf. Bernauer, 1995). Moreover, as an increasing number of good case studies becomes available, much can be said for investing more time and energy in *comparative reviews* of findings and hypotheses. For these and other purposes we need to take advantage of a wider range of methodological techniques, including also more 'rigorous' comparative designs, 'large-N' studies, and – where the range of variance in our empirical data is too narrow – perhaps even quasi-experiments in the form of computer simulations.[15] Some of these steps – comparative reviews and larger-N studies in particular – call for systematic *collaborative* efforts. They therefore seem to be appropriate topics for discussion within the framework of this Concerted Action programme.

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[14] More generally, it may well be a bit too easy to 'get away' with this kind of critique. In essence, what it amounts to is an argument that in order to increase the predictive or explanatory performance of a model we should *add* new independent (or intervening) variables. The argument is often correct in itself, but if we pursue this strategy we tend to end up with long lists of presumably relevant factors and only vague ideas about their (hypothesised) impact. For the development of theory, work directed at *(re-)specifying* the relationship between or among variables already included in a model may often be at least as productive as searching for a near-exhaustive inventory of independent variables.

[15] One of the challenges facing empirical studies with a narrow range of variance for important *in*dependent variables is to determine the impact of factors that come out as 'constants'. By itself, a constant accounts for nothing of the *variance* actually observed along the *de*pendent variable(s). It may nonetheless be a very important factor. Whenever expanding the range of observations is not a feasible option, 'thought experiments' may be the only approach we can use to shed light on the significance of a constant. Thought experiments can employ different techniques, but a general requirement is that they be made in a way that ensures a fair degree of *stringency* and *transparency*. It would be difficult to argue that the somewhat implicit mode of counter-factual reasoning that we find in much of the case-study literature can be considered *generally superior* by those standards.

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Appendix III: List of Participants

Steinar Andresen is Senior Research Fellow at the Fridtjof Nansen Institute (FNI), Lysaker, Norway. His research is concentrated in evaluation of the effectiveness of international regimes, with a particular focus on institutional features such as knowledge production processes. To this end, he has covered several topics, including the law of the sea, the whaling issue, and the climate change issue. Together with colleagues from FNI and CICERO he has recently submitted a manuscript on Science in International Environmental Regimes to MUP. He is also currently writing a book on the international whaling regime.

Helmut Breitmeier

Clare Coffey

Owen Greene is Research Co-Director and Senior Lecturer in International Relations and Security Studies at the Department of Peace Studies, University of Bradford, England. His main areas of research include international institutions, and the development, implementation and effectiveness of international agreements. In relation to international environmental politics, his work has focused particularly on the development and significance of transparency, reporting and systems for implementation review in international environmental regimes and the EU, and on the development, operation and effectiveness of regimes to tackle climate change, ozone depletion and Sea pollution (especially the Baltic Sea).

Joyeeta Gupta is Senior Researcher at the Institute for Environmental Studies, Vrije Universiteit, Amsterdam. Her major research interests include the negotiation and effectiveness of international environmental treaties, with particular emphasis on climate change agreements and North-South issues. She is interested in finding instruments and mechanisms to facilitate the effectiveness of international environmental treaties.

Nigel Haigh was, until recently, Director of The Institute for European Environmental Policy, London. He has worked on implementation of EC environmental regulations since 1980. In addition, he is editor of *Manual of Environmental Police: the EC and Britain* which is updated every six months and which consolidates much of the Institute's work on implementation.

Ellen Hey is Associate Professor at the Faculty of Law at Erasmus University, Rotterdam and Deputy Director of the Glodis-Institute. Her interest in the effectiveness of international environmental agreements is concentrated in their legal aspects, both from 'within' the law and from the perspective of the contributions that legal instruments may make to the regime. Her interests also include the role and rule of law in society, and the role of international organisations and non-state actors in decision-making and the implementation of international environmental regimes.

Matthijs Hisschemöller is Senior Researcher at the Institute for Environmental Studies, Free University, Amsterdam. His main research interests are problem structuring in environmental policy, the utilisation of scientific knowledge by policy actors, and the effectiveness of International Environmental Agreements. Recent publications include: with

Cees Midden, (forthcoming in 1998) "Improving the usability of research on the public perception of science and technology for policy-making," accepted for publication in *The Public Understanding of Science*, and with Joyeeta Gupta (1997), "Issue Linkage as a Global Strategy Toward Sustainable Development: a comparative case study of climate change," in *International Environmental Affairs.*

Stephan Kux is Senior Lecturer in Political Science at the Europainstitut of the University of Basel. His main interests include institutional aspects and problems of multi-level governance of international environmental regimes, including climate and clean air. Currently he directs a project in the Climate Change in the Alpine Regions (CLEAR) Program. Another projects investigates institutional effectiveness in cross-border environmental Cupertino. In an INTAS research project on environmental policy in the Russian regions he cooperates with a team of climate researchers of the Russian Academy of Sciences.

Lutz Mez is Senior Associate Professor at the Department of Political Science, Free University of Berlin, and Vice-Director of the Environmental Policy Research Unit. In 1993/94 he was visiting professor at the Department of Environment, Technology and Social Studies, Roskilde University, Denmark. His major research area is environmental and energy policy of industrialised countries with particular reference to nuclear and electricity policy. He is author of numerous articles and chapters in internationally edited books. Some relevant books or editions: include *Umweltpolitik und Staatsversagen* (1997) and *Electricity in Eastern Europe: 10 years after the Chernobyl disaster* (1997).

Arthur P.J. Mol is Associate Professor in environmental sociology and environmental policy at Wageingen University, Netherlands. His major fields of interest and publication include: European environmental policy, industrial transformation, ecological modernization theory, environmental policy and restructuring in NICs of Southeast and East Asia, and voluntary agreements in national and regional environmental policy. He is a board member of International Sociological Association RC24, and a member of the editorial board of *Environmental Policy and Planning.*

Konrad von Moltke is Senior Fellow at World Wildlife Fund in Washington, DC, Adjunct Professor of Environmental Governance at Dartmouth College and Visiting Professor of Environmental Studies at the Vrije Universiteit, Amsterdam. His research concentrates in international environmental relations, with recent work focused on environmental policy and international economic relations including debt, trade and development. He is editor of *International Environmental Affairs*, a journal for research and policy.

André Nollkaemper is Professor of Public International Law and International Relations at the Faculty of Law at the University of Amsterdam. His interest in the effectiveness of international environmental agreements is concentrated in several projects. Particularly, he is interested in analysing the distinction between legal and non-legal international agreements, as well as assessing the relevance of domestic factors such as the courts and national parliaments as determinants of the effectiveness of international agreements.

Sebastian Oberthuer conducts his research at Ecologic, Centre for International and European Environmental Research, in Berlin, Germany. He has dealt with issues of international environmental policy since the beginning of the 1990s. The focus of his work

is on the analysis of international environmental agreements and institutions and the mechanisms and forces that determine their effectiveness. His recent work has mainly dealt with the Montreal Protocol on Substances that Deplete the Ozone Layer and the UN Framework Convention on Climate Change (and its Kyoto Protocol) as well as the role of the European Community in international environmental regimes.

Lasse Ringius is the Project Coordinator of the EU Concerted Action project on the Effectiveness of International Environmental Agreements. He is Senior Research Fellow at the Center for International Climate and Environmental Research, Oslo (CICERO), in Norway. His main academic research areas include the study of international environmental regimes as well as environmental diplomacy and negotiations. His current research includes the formulation and implementation of climate change policies and policy instruments, burden sharing and differentiation, and joint implementation. His policy work focuses on policy and social responses to climate change impacts, and climate change adaptation strategies and guidelines.

Volker Rittberger is Professor of Political Science and International Relations and Director of the Center for International Relations/Peace and Conflict Studies, University of Tübingen. His main areas of interest include: theories of international relations, research on international institutions (organisations, regimes), comparative foreign policy analysis (Germany and OECD countries), and conflict and peace research. His recent publications are: *Theories of International Regimes* (1997) (with Andreas Hasenclever and Peter Mayer); and *The United Nations System and Its Predecessors*, 2 vols., (1997) (ed. with Franz Knipping and Hans von Mangoldt).

Mikael Román is Project Manager at the IPF Institute, Uppsala University, Sweden. His general research interests include regime theory, implementation theory, comparative politics, environmental politics, and Latin American politics. He recently concluded his PhD project entitled *The Implementation of International Regimes: the Case of the Amazon Cupertino Treaty.*

Peter H. Sand is Lecturer in International Environmental Law at the Faculty of Law, University of Munich. He was formerly Associate Professor of Law, McGill University Montreal, and Visiting Professor of Law, University of Addis Ababa, Ethiopia. He has been involved in the drafting and administration of multilateral environmental agreements for the past 30 years, as senior legal officer with FAO, IUCN, UNEP, UN/ECE, UNCED, and the World Bank. He has a special interest in economic and financial instruments for treaty implementation. Since 1998, he has been a member of the panel on environmental damage claims, UN Compensation Commission (Gulf War follow-up).

Detlef F. Sprinz is Senior Fellow at Potsdam Institute for Climate Impact Research and Lecturer at University of Potsdam. His research interests include the measurement of the effect of international institutions, international environmental policy, climate policy, environment and security, and social science methods. His current work includes further developing a measuring instrument for regime effectiveness, editing a book for MIT Press on "International Relations and Global Climate Change," development of aresponse module for environment and security research as well as methods to derive environmental thresholds. In addition, he teaches international environmental policy at the University of Potsdam.

Jens Staerdahl is Research Fellow at the Department of Environment, Technology and Social Studies at Roskilde University, Denmark. His research interest concentrates in the effectiveness of international environmental commitments, with particular emphasis on the implementation of the Long-Range Transboundary Air Pollution agreements in Denmark. His work attempts to isolate how international negotiations and commitments influence national environmental regulations and the behaviour of various target groups, as well as examining specific mechanisms that enable the achievement of behavioural effectiveness.

Arild Underdal is Professor of Political Science at the University of Oslo, Norway, and Senior Research Fellow at the Center for International Climate and Environment Research (CICERO). His major fields of research are international environmental regimes and international negotiations, with a particular interest in the conditions for 'success' and the causes of 'failure'. He served as Vice Rector of the University of Oslo (1993-1995), Vice President of ISA (1994-1995), and Chair of the IPSA Study Group on 'The Politics of Global Environmental Change' (1991-1997). He is currently Vice Chair of the IHDP Scientific Committee (1996-).

Jacob Werksman

Jørgen Wettestad is Senior Research Fellow and Program Director at the Fridtjof Nansen Institute, Lysaker, Norway. His research interests are concentrated in regime theory, with specific focus on questions related to the effectiveness and design of international environmental regimes. He has conducted empirical studies on the acid rain regime (LRTAP), the ozone layer regime, the climate regime, and the PARCON/North Sea regime. As well, his research has focused on environmental policy-making and implementation within the European Community and selected European countries. His recent book, *Designing Effective Environmental Regimes: The Key Conditions* examines specific institutional issues in international environmental politics.

Appendix IV: Participants of Each Workshop

Participants: International Regime Effectiveness: Concept, Measurement and Relationship to Other Concepts

Lasse Ringius (Chair)

Detlef Sprinz (Rapporteur)

Ellen Hey

Volker Rittberger

Arild Underdal

Participants: The Role of Endogenous Factors

Jørgen Wettestad (Chair and Rapporteur)

Clare Coffey

Owen Greene

Lutz Mez

Konrad Von Moltke

Sebastian Oberthur

Peter Sand

Jens Stærdahl

Participants: The Role of Exogenous Factors

Matthijs Hisschemöller (Chair)

Stephan Kux (Rapporteur)

Helmut Breitmeier

Joyeeta Gupta

Nigel Haigh

Arthur Mol

Mikael Roman

Jacob Werksman